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SECOND ANNUAL REPORT
of the
COUNCIL OF
NATIONAL DEFENSE



FOR THE FISCAL YEAR ENDED
JUNE 30, 1918

WASHINGTON : 1918

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LETTER OF TRANSMITTAL.

COUNCIL OF NATIONAL DEFENSE,
Washington, October 31, 1918.

MY DEAR MR. PRESIDENT: I have the honor to transmit to you herewith, for submission to the Congress, in accordance with the provisions of the Act establishing the Council of National Defense, that "An annual report to the Congress shall be submitted through the President," the second annual report of the Council of National Defense, covering the activities of the Council and the agencies subordinate to it for the fiscal year ending June 30, 1918.

NEWTON D. BAKER,
*Secretary of War and
Chairman of the Council of National Defense.*

To the PRESIDENT,
The White House, Washington, D. C.

SECOND ANNUAL REPORT OF THE COUNCIL OF NATIONAL DEFENSE.

COUNCIL OF NATIONAL DEFENSE,
Washington, October 30, 1918.

The Hon. NEWTON D. BAKER,
*Secretary of War and Chairman of the
Council of National Defense.*

SIR: Herewith I have the honor to hand you the second annual report of the Council of National Defense and its Advisory Commission, and the various boards, sections, and committees under both the Council and the Commission, for the fiscal year ending June 30, 1918.

"THE CREATION OF RELATIONS."

Among the functions of the Council of National Defense outlined by the Act creating the Council, quoted in full in the first annual report, is "the creation of relations which will render possible in time of need the immediate concentration and utilization of the resources of the Nation." It has been through the performance of the duty thus defined, liberally interpreted in the light of a great national emergency, that the Council has performed its most important service during the year just passed.

Designed to carry out an extensive program of investigation, research, and recommendation in preparation for some future war of defense inferentially far distant, the Council was confronted with the "time of need" suggested by the Act three months after its organization. Only the barest outline of an extensive program of preparation had been so far indicated. The Council's duty was obvious. It had not been designed for executive action, but its elastic structure, utilized with imagination and a purpose to serve, could be adapted to drawing together immediately the country's resources and making them available to the authorized executive agencies of the Government, or to initiating and planning the organization of new agencies which could be clothed as need demanded with the requisite power. To this task it has devoted itself chiefly throughout the past year. In a sense the Council has served as a great administrative laboratory through which new plans and new and necessary functions could be initiated and developed, and where effective action demanded, passed on to permanent or emergency executive agencies of the Government.

In its work the Council has had the whole-hearted assistance of some of the most capable business and professional men of the country, de-

voting themselves unsparingly, especially in the first few crucial months of the war, to the work of war organization. Yet whatever success the Council may have achieved must not be attributed exclusively to capable professional staff work on the part of its various branches. It has been due as much and in the last analysis, perhaps far more, to the fact that in mobilizing America's material resources for the Government the Council has been able to draw together and focus concurrently some part of that still greater asset, the spirit of the men and women who controlled those resources. Indeed, it has been chiefly through this effort that it has been able to achieve as much as it did achieve in material organization. Any such task to be performed with success must be undertaken along lines really representative of the national character, as only thus can opportunity be given for the freest expression of the country's energies. The achievements of the early mobilization of American resources under the Council's leadership were successful in the measure to which they fulfilled the desire of the American people to be of the greatest service in the task before the Nation. The Council served as a channel for directing this voluntary effort in a unified way.

THE TRANSITION PERIOD OVER.

With the completion of the work of initial mobilization, the main task which it undertook in the emergency, the Council has resumed functions more nearly resembling those originally conceived for it. The great responsibility which the Council assumed as its contribution to the war was the direction of the country's transition from a peace to a war basis. It undertook to act as the connecting link between the Nation in its normal state and the Nation as a machine for making war. This transition period safely passed, the Council's rôle as a main link in the war government naturally becomes less active.

May 28, 1918, the date of the formal separation from the Council of the War Industries Board, an agency which the Council initiated and which was developed for many months under its direction, marked the virtual end of the Council's task in planning emergency machinery to meet new war functions. This, naturally, diminishes in no way the usefulness of the important work which remains, such as the work of the State councils; the direction through the Woman's Committee of the war activities of women; the valuable work of the Committee on Labor; the advisory work of the Medical Section, supplementing the efforts of the executive medical agencies of the Government; the functions of the Highways Transport Committee; and of the other sections and divisions of the Council.

To review briefly the general character of the Council's activities during the year, June 30, 1917, found the original Council of six members and its Advisory Commission of seven representative business and professional men supplemented by a large and rapidly growing system of committees and boards covering almost every phase of war activity not purely military, the great majority of them composed of men who were receiving no remuneration for their services. Although the Council had been finally organized only in March, 1917, the end of June found its record of achievement important, not only in the development of plans but in practical and definite material results. The character of those first results I had the honor of outlining to you in the first annual report of the Council. Yet at the close of the period covered by that report some of the Council's most important activities had not even been considered, and the scope of the great majority of them was still undetermined. In some directions the efforts of various branches of the Council and Advisory Commission have extended far beyond any plans thought of on June 30, 1917. The pressure of a year of war has inevitably reshaped and expanded the most extensive plans which could be foreseen in the early days of 1917.

It will remain for the individual reports of the several boards and sections of the Council to give in detail the activities of these subordinate branches of the organization.

THE COUNCIL AND COMMISSION.

Both the Council and the Advisory Commission have met regularly throughout the year for the determination of policy and the discussion of problems relating to national defense. Many of these questions the Council has been the only Government body to consider in group discussion. In December the Council's deliberations were supplemented by a weekly conference, attended, in addition to the members and Director of the Council, by the Food Administrator, the Fuel Administrator, the Chairman of the Shipping Board, and the Chairman of the War Industries Board. In the spring of 1918 these weekly conferences were superseded by the President's weekly "war council."

Among the varied problems which have come before the Council and Advisory Commission for their joint or separate consideration, to enumerate only a few, have been those relating to governmental organization; war labor policy, including general industrial relations, the housing and transportation of workers, the training of emergency labor, the I. W. W. problem, and many allied questions; shipping, food, fuel, and transportation; general medical policy; industrial policy, including the transference of industrial plants

from peace to war work; the question of commercial conservation; and many problems involving the general public morale.

The initial work of the Council looking toward the development of policy on food conservation was passed on to the Food Administration with the organization of that agency. The achievements of the Committee on Coal Production with the benefit of their several months' experience in studying the coal problem were placed at the disposal of the Fuel Administration when that was organized. The work of the Aircraft Production Board, organized first as part of the Council, was enlarged and carried on with its separation and organization as a new agency. The ideas and general policies underlying the work of the War Industries Board are the consistent outgrowth of the Council's original plan to draw together for common planning various branches of the Government which touched industry, developed by experience from the original General Munitions Board through the successive stages of reorganization which the War Industries Board has undergone.

In the development of a national transportation policy before the inauguration of the United States Railroad Administration in December, 1917, the Council had done extensive work in drawing together for the purpose of the war the railroads, the waterways, and the national highways. Not only had it done all it could under existing legislation toward drawing the railroads together into a voluntary national system, but it had done much toward the increase of the use of inland waterways and motor-truck routes, relieving the congested roads as much as possible in this way.

The ways in which these problems have been brought before the Council and the method adopted in dealing with them have both varied greatly. At times they have been discussed first by the Advisory Commission and brought before the Council with a recommendation. At other times they have been brought to the attention of the Council through Government departments or other governmental organizations or through private citizens. The Council's general practice in handling questions which it did not itself act upon directly has usually taken one of three forms. Where the question apparently lay within the discretion of one of the executive departments or of an already existing Government agency, the Council referred the matter under discussion to this agency for executive action with or without a recommendation. In this way questions of overlapping jurisdiction could frequently be settled. Where no agency for handling the matter existed and where some further investigation seemed advisable before a decision could be reached, the Council has frequently referred the matter to the Advisory Commission for investigation or to one of the subordinate committees before acting. Where the question was one of particular

urgency and unusual authority was needed for its solution, the Council, after a thorough discussion, at times referred the matter directly to the President for final determination, usually with a recommendation. In the interest of good administration all these activities of the Council and the Advisory Commission and their subordinate bodies have been focused through the director's office.

ADMINISTRATIVE CHANGES.

Many changes in the Council's own administrative machinery developed during the year. From the outset the purpose of the Council and the subordinate committees of the Council was to offer a channel through which the voluntary efforts of American industrial and professional life could be focused. The story of the way in which the members of these committees, practically all of them serving without compensation, rallied to aid in the common cause and the extent of the practical accomplishment of their voluntary service has probably not been equaled anywhere. The general spirit underlying these original committees was fundamentally that of business organizing itself in aid of the Government. Lack of time for complete organization by industry made impossible the formal election of the members of these committees by the industries which they represented. In choosing the membership the Council sought for a representation from the industry as wide as practicable. It is probable that at this particular stage in the progress of the war no plan could have produced such effectual results in so brief a time as this voluntary system was able to show. The natural processes of administrative evolution gradually eliminated the old, large committee system in the case of the industrial committees and substituted for it a closely knit scheme of sections under the general head of the War Industries Board, in which each section head had general authority over dealing with the industry with which he was particularly familiar. At the same time the industries of the country were rapidly organizing to assist the Government in carrying on the war and were creating representative war-service committees of their own, thus simplifying and strengthening the method of cooperation of business with the Government.

One of the most persistent and most important of the problems with which the Council has dealt during the year has been the war labor administration question. As a result of a series of investigations and discussions on the subject carried on by different sections of the Council and by the Council and commission, and finally crystallized in the work of the Industrial Service Section, appointed in the fall of 1917, a general plan for a national labor administration

was drawn up in cooperation with the interested departments of the Government at the beginning of the year 1918 and submitted to the President after its formal adoption by the Council. The plan was accepted by the President and turned over to the Secretary of Labor to be put into effect.

In addition the Council paid particular attention to industrial disturbances on the Pacific coast, and it was at the specific request of the Council that the President's Commission, with the Secretary of Labor as chairman, was sent to the Pacific coast in the fall of 1917 to investigate and report on conditions there.

The housing situation also received most careful investigation, and at the time the housing problem was turned over to the Department of Labor, in January, the Council was able to place in the hands of the Secretary a large amount of valuable material to assist his administration in its action on the matter.

In its effort to mobilize the spirit of the country and bring to the aid of the conduct of the war the efforts of every section of the Nation, the Council has been aided particularly by the unique organization built up under the State Councils Section, with the State, county, municipal, and community councils at the date of this report numbering well over 100,000. Through this decentralized system the Council has been able to bring home to each individual citizen the meaning of the policies of the Government and the opportunities for service in the war in a way possible only to local agencies. This network of voluntary governmental agencies has been and still remains a most useful instrument for national cooperation which may well prove as valuable in the difficult days of readjustment as in war. In like manner, and functioning as part of the same general scheme, the Woman's Committee has been crystallizing the sentiment and the activities of the women of the country behind the war.

Special acknowledgment should be made of the highly valuable activities of the National Research Council, a full report of which is included herein. The National Research Council has served as a department of the Council of National Defense, mobilizing and directing the research work of the country's scientific men. For the funds to carry on this work it has drawn partly on the appropriations of the Council and partly on private resources and contributions of its own. Its work has been invaluable in giving the Government war agencies the benefit of scientific research, both directly and indirectly applicable to the purposes of the war.

Ever since the organization of the Council of National Defense it has been used, through the main executive office in Washington and the various State Council offices, as a recruiting station for various branches of the Service, besides assisting in various ways in the Gov-

ernment personnel problem and acting as a clearing house for civilian appointments in the various bureaus in Washington doing war work. Several hundred men have been commissioned in the Army and Navy through the assistance of the staff of the Council of National Defense, and when a group of special types of men have been wanted, such as in the Chemical Warfare Service recently and in the Naval Reserve Flying Corps, the Council has been of much service in securing the right men.

The reports of the various branches of the Council have been divided as follows: First, those still acting as committees and sections of the Council of National Defense; second, those which were already or became a part of the War Industries Board on the date of its separation from the Council; and, third, agencies discontinued or transferred to other jurisdiction during the fiscal year.

Very respectfully,

W. S. GIFFORD, *Director.*

STATE COUNCILS SECTION.

On April 9, 1917, the Secretary of War, as chairman of the Council of National Defense, issued to the governor of every State a request that if he had not already done so, he create a State council of defense or a similar body to promote and coordinate the war activities of the State and to cooperate with the Federal Government and the Council of National Defense in the prosecution of the war. This request was followed by a National Defense Conference held in Washington on May 2 and 3, at which every State was represented, and during which the first steps in the organization and the work of State councils of defense were developed.

The State Councils Section was created to exercise the following functions in regard to these State councils of defense: To guide their growth and work; to afford to each the benefit of the experience of the others; to act as the communicating agency to bring the Council of National Defense and the other Federal departments and war administrations in touch with the State councils of defense; and to make the services of the State councils most available to the Federal Government.

In the execution of these functions the State Councils Section has pursued the following definite policies:

(1) While transmitting to the State councils of defense the requests for assistance of the Council of National Defense and other Federal departments, the section leaves to each State council the development of the means of providing this assistance in the light of its intimate knowledge of local conditions.

(2) The section deals directly with no other agency in each State except the State council, referring to it all requests for direction and

all offers of assistance from any individual or association within the State, and leaving entirely in its hands the conduct and direction of its local organization and the solution of all local problems.

(3) The section encourages each State council to undertake spontaneously and to execute independently war activities adapted to its local war needs or to making its local resources available to the Nation, and endeavors to map out the broad policies under which this spontaneous work can be of most use to the Nation.

(4) The section confines its encouragement to activities directly related to the war and discourages the undertaking of a large number of unrelated activities, urging each State council to concentrate its effort upon the development of a few important policies.

(5) The section endeavors to stand sponsor to the State councils for the effective execution of the tasks intrusted to them by the Federal Government.

(6) The section requests the departments and war administrations of the Federal Government to conduct through the State councils of defense all activities in the several States suited to the decentralized character of the State council system. The section also studies the work done by the State councils in response to requests from Washington in order to apprise the department or administration concerned of the response to their requests, and as a basis for planning future work.

ORGANIZATION OF STATE AND LOCAL COUNCILS OF DEFENSE.

The State councils of defense, as the official war emergency organizations of the States and as the recognized agencies through which the Council of National Defense conducts war work in the States, exercise a fourfold function:

- (a) To create and direct local councils of defense.
- (b) To centralize and coordinate the war work of the State.
- (c) To inaugurate independent activities for State defense work.
- (d) To assist the Council of National Defense and the Federal departments and war administrations in their war programs.

By the end of June a State council of defense¹ had been created in every State in the Union. The State councils section urged that whenever possible each State council be established by statute and that an adequate appropriation be made for State council work. It also assisted the State councils by drafting an outline of a model statute based on the experience and suggestions of all States. Wherever State legislatures were then in session such statutes were enacted, and as other State legislatures have come into session additional

¹ In a few States the titles "Committee of Public Safety" or "War Preparedness Board" are used to designate the State council of defense.

statutes have been passed. To date 23 State councils¹ have been created by statute, 29 States² have available State funds ranging from \$1,500 to \$5,000,000. Five additional States³ have been given the right to spend without limit, on the approval of the governor, and five others⁴ have available private funds of from \$10,000 to \$100,000. The State Councils Section has again assisted by providing information and syllabuses of the best types of war emergency legislation passed by the several States.

COUNTY AND TOWNSHIP COUNCILS.

By the end of June also the organization of county or township councils of defense had been begun generally throughout the Nation, and several activities had been undertaken by the State councils at the request of the Council of National Defense and certain other Federal departments and war administrations.

During the first six months of the new fiscal year the State Councils Section directed its efforts especially to the stimulation and direction of the growth of this local defense organization and to the awakening of the people to the war issues, the war needs, and the possibilities of assistance in the prosecution of the war by all citizens. Forty-six States now have complete systems of county or similar councils of defense actively at work, and in the remaining two the development of such systems is being actively carried on. This county organization, though almost entirely the result of independent work in the case of the stronger State councils, was developed in the less advanced States by the assistance and field work of the State Councils Section.

Following the general completion of the system of county and similar local councils of defense, the section, uniting with the Woman's Committee of the Council of National Defense, urged the extension of the national defense system to the smaller district units by the establishment of community councils of defense. The community council of defense is not merely a committee, as is the State or county council; it is the community itself, with all its citizens and agencies organized for national service. Without the community councils of defense the channels of communication of State and county councils would in a measure empty into the air; with them the Federal Gov-

¹ California, Delaware, Illinois, Georgia, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Montana, Nebraska, New Jersey, New Mexico, New York, North Dakota, Pennsylvania, South Carolina, South Dakota, Texas, Virginia, West Virginia, Wisconsin.

² Michigan \$5,000,000, Pennsylvania \$2,760,000, Massachusetts \$2,030,000, Maryland \$2,000,000, Maine, Minnesota, New Hampshire, and New York \$1,000,000 each, New Mexico \$750,000, Ohio \$200,000, Rhode Island \$150,000, California, Indiana, and New Jersey \$100,000 each, Colorado, Illinois, and Kentucky \$50,000 each, Louisiana, Montana, Nebraska, South Carolina, Texas, and Utah \$25,000 each, South Dakota \$20,000, North Dakota \$15,000, Oregon and Virginia \$5,000 each, Georgia \$2,500, Mississippi \$1,500.

³ Connecticut, Iowa, Washington, West Virginia, Wisconsin.

⁴ Missouri \$100,000, Idaho and Wyoming \$50,000, Colorado \$25,000, Arkansas \$10,000.

ernment may reach every individual in every community, and through them every individual may find his place in the work of the war.

In response to the request of the Council of National Defense the State councils have created an almost nation-wide system of community councils of defense as the terminal organization of the council of defense system. In 42 States the program of the State Councils Section for the development of community councils has been adopted. In four others¹ a somewhat modified form of community organization has been instituted. Sixteen States have organized community councils in every county in the State, and in the other States the organization is progressing rapidly. The school district, which was recommended as an apt though not essential unit of organization, is being used as the basis for the creation of community councils of defense in the majority of States. The Department of Agriculture, the American Red Cross, the Committee on Public Information, the Bureau of Education, and the Commission on Training Camp Activities have all cooperated. The section is also urging the development of local organization for negroes, and in some of the Southern States the State council system is supplemented by negro councils of defense.

In order to aid the State councils in their organization and work, three district representatives of the State Councils Section have been appointed to cover the following groups of States:

(1) Arkansas, Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, Wisconsin.

(2) Arizona, California, Idaho, Nevada, New Mexico, Oregon, Utah, Washington.

(3) Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and West Virginia.

These representatives are in constant personal touch with the State councils and are thoroughly familiar with their local conditions. They assist them in building up their work and in establishing closer contact with the Council of National Defense. The section also has had one traveling representative who has made frequent trips to the State councils during the periods of their reorganization and at other critical times, and has represented the Council of National Defense at the State war conferences which have been conducted by the State council of defense in nearly all States. He has also visited States needing stimulation and encouragement to explain the work of the Council of National Defense and the methods of developing further their State council activity.

¹ Massachusetts, New Hampshire, Rhode Island, and New Jersey have township councils.

REQUESTS FROM FEDERAL AGENCIES.

During these months of organization, of awakening the people to the war emergency and of gaining recognition of the value of defense work in the several States, the section transmitted a number of requests from various Federal departments and war administrations for assistance in their important campaigns. Again, as far as the adjustment could be arranged at Washington the State Councils Section endeavored to articulate closely with the State councils of defense those Federal agencies which extend into the States and counties. In most instances the section arranged that these State agents should be nominated to the Federal administration by the State council of defense. At the same time a great deal of important independent work relating both to local demands and to national needs was initiated by the various State councils. There was, however, little uniformity of action throughout the several States, and except for the scattered requests from Washington almost no war activity was being conducted on a nation-wide basis. Up to that time the State Councils Section had transmitted to the State councils only such requests for assistance as had been made to it by the committees of the Council of National Defense and the departments of the Federal Government. There had been little attempt to draw up national programs which would cover all branches of defense work in all States.

By the first months of 1918 State and local councils of defense had been thoroughly organized in nearly every State. The council of defense system was recognized both at Washington and in the States as an effective means of reaching the individual citizen and of mobilizing the efforts of the people for winning the war. The State councils were ready for more definite and more constructive programs. The section wished to maintain its policy of trusting to State council initiative in the majority of cases, but it felt that it could be of more use to the various State councils if it could lend a guiding hand in every field and if it established a well-defined policy with regard to every phase of defense work. In this way the various independent activities of the respective State councils could be brought together into a national program. Accordingly the State Councils Section has issued, and is issuing, broad programs outlining definite policies and constructive measures for accomplishing the best results in every field of war activity. The State councils are urged to develop these programs independently, adapting them to local conditions.

The work of the State Councils Section can best be judged by the results accomplished. Its work is necessarily so intimately connected and so interwoven with that of the State councils of defense that it is difficult to distinguish in the great number of things accomplished

just which have been done at the instance of the State Councils Section and which are due to the independent initiative of the State councils themselves.

In a resolution of the Council of National Defense all Federal departments and war administrations have been requested to communicate with the State councils only after the presentation of their plans to the Council of National Defense through the agency of the State Councils Section. The section has established working connections with a number of Federal departments and war administrations and has transmitted requests and suggestions from them to the various State councils. The State councils in turn have often given valuable help to the following Federal agencies, among others; War Department, Navy Department, Interior Department, Department of Agriculture, Department of Commerce, Department of Labor, Treasury Department, Department of Justice, United States Shipping Board, United States Food Administration, United States Fuel Administration, Committee on Public Information, and the American Red Cross. The principal lines of State council activity are here summarized under a number of general headings.

PUBLICITY.

As a valuable factor in the work of the State councils the section has advocated the employment of an expert to handle all publicity. Publicity representatives have been appointed in every State and have been of great service in putting out news of the State council and pushing its campaigns, and in handling the news of campaigns undertaken by the State councils on behalf of the Federal departments and war administrations. Among these were the campaign for the United States shipyard volunteers and the enrollment of the Boys' Working Reserve, in both of which the State Councils Section took an active part.

Twenty-six States have published war material of one kind or other in pamphlet form, and 19¹ issue at regular intervals a State council war bulletin. A number have used bulletin boards as a means of spreading war information. In all publicity work the State councils section maintains close connection with the Committee on Public Information; its effort has been to enable the Committee on Public Information and the State councils to be of service to each other. The section has disseminated a good deal of material relating to the work of the Committee on Public Information and has distributed some printed matter on its behalf. A special instance of this was the circulation of 400,000 "Prussian blot" posters adapted by the State Councils Section from a Connecticut State council poster.

¹ Alabama, Alaska, Arizona, Connecticut, Illinois, Indiana, Iowa, Kansas, Louisiana, Maryland, Michigan, Minnesota, Missouri, New Mexico, Oklahoma, Pennsylvania, South Dakota, West Virginia, and Wisconsin.

In connection with publicity work the section has urged the formation of speakers' bureaus related to the speaking division of the Committee on Public Information and the Four-Minute Men organization, and has recommended speaking campaigns beginning with State war conferences and ending with county, district, or local conferences. Such State war conferences have been called by 37 State councils. Nearly all of these conferences were held at the direct instance of this section and of the speakers' bureau of the Committee on Public Information, and according to plans thoroughly worked out here. The traveling representatives of the State Councils Section have made several tours to be present at such war conferences and to bring before the people the aims and purposes of the Council of National Defense and the State councils of defense. Testimony concerning the great value of these conferences in stimulating State council work and getting under way local speaking campaigns is impressively unanimous.

A nation-wide program for community Fourth of July celebrations was prepared in conjunction with the Committee on Public Information and was sent out from this section to all the State councils. It has met with vigorous response in all parts of the country. This program was drafted in accordance with the desire of President Wilson that the foreign born of this country should on the Fourth of July be given an opportunity to express their loyalty to the United States. It is expected to have a direct influence on the Americanization work of the various State councils.

In connection with the local war conferences and patriotic meetings the State Councils Section has advised the establishment of liberty choruses for community singing, and seven States¹ have already organized such choruses with success. Connecticut reports that it has 120 liberty choruses available. Pennsylvania also is one of the pioneers in the movement. In those States in which it has been tried the liberty chorus is considered one of the most effective means of arousing the enthusiasm of the people.

The use of State fairs as a means of reaching the people with patriotic meetings and addresses has been brought to the attention of the State councils, with the result that a number are making plans to hold war conferences at the time of their State fair. A number of other effective independent publicity measures have also been undertaken by the various State councils. There are specific instances of the general effort of the State councils to stimulate and assist all State councils in building up publicity machinery which will reach every citizen in the interests of State council work. This machinery, reaching the public, as it does, through speakers, the press, State council bulletins, periodicals, pamphlets, posters, and

¹ Connecticut, Pennsylvania, Wisconsin, Idaho, Illinois, Maine, Minnesota.

trade and fraternal organizations, is a powerful means of public education from one end of the country to the other which is constantly being used on behalf of the various Federal departments and war administrations.

MILITARY.

The State councils independently took an important part in recruiting during the entire duration of the recruiting campaigns. Their activities were of many kinds. Wide publicity was secured through the newspapers, speakers, advertisements, posters, and circular letters to eligible young men. The State councils worked through the labor bureaus and through county committees appointed especially for this purpose. Parades and patriotic meetings were arranged by many State councils in the interests of recruiting.

At the request of the War Department the State Councils Section outlined definite work for State councils in assisting the local draft and exemption boards on registration days and in enrolling and classifying drafted men. The State councils responded in many different ways. In some States registration notices were printed and posted, in others explanatory cards were sent out. New York, for example, established an information service which took care of 1,000 queries per day, while the California State council met all registration expenses in the State. In April their aid was again requested in transcribing and returning their occupational cards, and the return of these cards to the office of Provost Marshal General show a marked increase at the times when this assistance was requested.

Recently the State Councils Section, with the approval of the Provost Marshal General, has suggested that the State councils assist in enforcing the law dealing with men engaged in nonessential industry. The State councils have been asked to secure maps of enemy territory, to aid in the compilation of the photographic history of the United States in the war, and the collection of binoculars and spy glasses for the Navy. The chairman of the various State councils have been asked to nominate the vice chairman of the State committees on explosives which have been established throughout the country by the Bureau of Mines.

The State Councils Section, in cooperation with the American Bar Association, requested the State councils of defense to undertake to see that all men entering the service are advised as to their legal affairs. Through State and county legal committees appointed in 41 States especially for this purpose the drafted men are now approached individually and advised as to the necessity and means of putting their affairs in order. In most States connection with the local agents of the home service section of the American Red Cross has been established, so that the county legal committees of the State

council supplies legal advice to the American Red Cross when it is desired. Twenty-one State councils¹ report that every county in their State has a county legal committee.

Further in connection with preparing the drafted men for entrance into camp the section has urged the State councils of defense to arrange meetings of men subject to the draft for instruction as to the conditions and problems which they face. This program provides that the drafted men shall be gathered together and given talks on military conditions and requirements, on social hygiene, and on the legal adjustment of their affairs. Twenty-nine State councils² have already held meetings of this nature throughout the State and a number are planning to do so in the near future.

The State Councils Section in conjunction with the Commission on Training Camp Activities has arranged for joint work by the State councils and the local representatives of the commission in districts about the camps. Together the section and the commission have worked out a broad program of policies to be pursued in the work. The State councils of defense have been especially active in the raising of the war camp community fund, in providing comforts, in establishing moral police, in arranging recreation for the men in the camps and in coordinating and centralizing the efforts of the formerly confused energies of the many voluntary agencies desiring to contribute to the welfare and comfort of these men.

AMERICANIZATION.

Working in connection with the Bureau of Naturalization of the Department of Labor and with the Bureau of Education of the Department of the Interior, the section has presented to the State councils a comprehensive program for Americanization work. Strong emphasis upon the need for such work and broad policies for organization were incorporated in the program. The State councils have been urged to centralize State and voluntary Americanization agencies and to conduct an Americanization campaign constituting themselves the central responsible agency for war-time Americanization work on behalf of the Council of National Defense and the two Federal departments most interested in the matter. In response to this appeal 22 State councils³ have formed special Americanization

¹Alabama, Arizona, Arkansas, California, Colorado, Idaho, Kansas, Kentucky, Maine, Maryland, Michigan, Nebraska, New Jersey, North Carolina, North Dakota, Ohio, South Dakota, Tennessee, Utah, West Virginia, Wisconsin.

²Alabama, Arizona, Arkansas, California, Florida, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maryland, Missouri, Michigan, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Oklahoma, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Washington, West Virginia, Wisconsin, Wyoming.

³Arkansas, California, Colorado, Connecticut, District of Columbia, Idaho, Indiana, Kansas, Louisiana, Massachusetts, Minnesota, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Ohio, Pennsylvania, Rhode Island, Tennessee, Utah, Wisconsin.

committees, or have designated some special agency to formulate and carry out a constructive Americanization program adapted to conditions in their State. In several States following up the first steps suggested by the Bureau of Education and this section, war information bureaus have been established for the benefit of immigrants.

The Americanization activities of the State councils of defense have been varied in character. A few are here mentioned to give an idea of the range and scope of the work.

A number of State councils have cooperated with educational authorities to secure additional classes for the teaching of English to the foreign born, and press releases for the foreign-language papers have been issued by State councils to bring the aims of the United States in the war before the foreign born of the country. A number of State councils have been active in encouraging and facilitating naturalization and disseminating information as to how to set about becoming a citizen of the United States. Early action by the State councils in regard to the foreign born consisted primarily in their registration and in surveillance to prevent sedition. With the development of the campaign by the State Councils Section and the Bureaus of Education and Naturalization constructive activities looking toward ultimate absorption predominate.

SEDITION.

From the very first the State councils of defense in addition to the loyalty campaigns which they have carried on through their speakers and the press undertook extensive work to reach personally individuals of questionable loyalty and to arouse their patriotism, and a number of definite methods of dealing with them by personal contact were developed. The State Councils Section with the approval of the Department of Justice has sent out a bulletin defining the policies to be pursued with regard to this phase of war work. The State councils were called upon to conduct vigorous and persistent campaigns through their local machinery and through personal contact to arouse the loyalty of each citizen and draw him into active participation in war work, paying special attention to apathetic and apparently disloyal persons. The fact that all direct suppression of sedition rests in the hands of the Department of Justice was stressed and the State councils were urged to devote their efforts to arousing rather than enforcing loyalty.

At the instance of the Alien Property Custodian the State councils have been asked to aid in the location of alien property. A ready response to this appeal has been received and material assistance has been rendered by a number of State councils.

PRODUCTION AND CONSERVATION OF FOOD.

The activities of the State councils in food matters have been directed largely by the policies of the Food Administration and the Department of Agriculture. The State Councils Section is in constant communication with both of these Federal agencies and its recommendations have been drafted so as to conform with theirs. Its primary effort has been to secure close, permanent contact between each Federal Food Administrator and State council, and between each State extension director and State council. In addition, it has issued recommendations on certain activities of immediate importance, and has always sought to bring particularly ingenious methods worked out in any one State to the attention of others. In general, however, the details of the very extensive work of State councils in connection with food have been developed in the States by the State councils in association with the representatives of the national food agencies.

Production.—Contact between the State extension directors and the food production committees of State councils has been particularly close. Similar relations exist generally between the county agents and other field workers and the county councils of defense.

Among the many activities of State councils of defense relating to food production a few general lines may be indicated. Every State council is carrying on propaganda on behalf of increased general production, through news items, speakers, posters, and personal contact. In addition to this campaign for increased acreage generally, most States have been especially active in connection with certain crops of peculiar importance to the State. One of the most fruitful methods of increased acreage of these crops has been the assignment of definite acreage quotas to the several counties of the State, responsibility for the realization of which is lodged with the county councils. State-wide surveys and investigations have been made in over one-third of the States, in addition to special surveys on seed, tractors, etc. Campaigns have been conducted to encourage the use of labor-saving machinery and to secure more intensive utilization of existing machinery through encouraging cooperative relations among farmers. In addition to urging farmers to increase their acreage, State councils of defense have been instrumental in providing definite assistance to them. Such assistance has included arrangements for funds for the purchase and sale of seeds and the advance of short-time credit for farmers who could not otherwise plant their crops. State and local councils have been instrumental in trained direction for the home garden movements, etc.

Conservation.—Running parallel with their activities for the production of food the State councils have done constructive and effec-

tive work in the field of conservation. In addition to vigorous publicity campaigns to promote the programs of the United States Food Administration and the administrators in the States, the distribution of conservation pledge cards during the early summer of 1917 was conducted by many of the State councils. In association with the local food administrators, recipes for economical dishes were prepared and published in cookbooks or distributed through the press. The Illinois State council reports that over 150,000 copies of its patriotic cookbook have been sold. Movements for household and hotel economy have been undertaken and classes organized whereby housekeepers may be taught the most economical methods of cooking. In general State councils have developed their conservation work as a result of contact with the State food administrator or on their own initiative.

FUEL.

Like food conservation, fuel conservation has been placed in charge of a local administrator. To effect the closest cooperation between the State councils and the Federal Fuel Administrator the State councils were asked through this section to nominate suitable candidates for appointment by the Federal Fuel Administrator. In several States the fuel administrator maintains his headquarters in the State council office, and in many he is a member of the State council. In Michigan, for example, the State war board provides the fuel administrator with financial support. In Nebraska a special committee of the State council handles the question of fuel supply and conservation in connection with the fuel administrator. The State council publicity machinery has been of great value in the matter of fuel conservation. Independent activity along the lines of fuel conservation has been undertaken by a number of State councils, such as the issuing of directions for the economical use of coal, the urging of the people to place the orders for their next year's coal as soon as possible, censuses as to the supply and demand for coal of the dealers of the State determining the needs for the coming year, the substitution of wood wherever possible, and various transportation measures to facilitate the delivery of coal.

FINANCIAL ACTIVITIES.

In connection with the decentralized local agencies of the Treasury Department and the Federal reserve banks, the State councils have done effective work in the liberty loan and war-savings stamp campaigns. The section has brought each special campaign to the attention of the State councils of defense with an urgent appeal that they do all in their power to assist the State finance committees. Forty-six States have responded with assistance of one kind or other.

Some furnished publicity, others turned over their machinery for the use of the campaign committees, and still others have handled the entire campaign throughout their State. The county and other local councils of defense have also been effective in working directly with the local committees of these Treasury agencies.

Further services have been rendered to the Treasury Department in the extension of the Federal reserve system, in the collection of income-tax returns, and in connection with the Bureau of War-Risk Insurance.

INDUSTRY.

On behalf of the War Industries Board, the State Councils Section transmitted to the various State councils a resolution defining the policy of the War Industries Board with regard to the undertaking of new industrial enterprises not essential to the conduct of the war. Several State and local councils have assumed the function of passing upon the desirability of all new enterprises, particularly public improvement. The section recently sent out a further statement from the War Industries Board concerning priority policies affecting industries.

The State councils have undertaken a number of independent activities in the matter of industry. Fourteen States have made industrial surveys of one kind or other, and one has completed a survey which has been employed by the Ordnance Department. Miscellaneous activities by the State councils relative to this branch of war work relate to Government contracts, to priorities, and to by-products.

ECONOMY.

The resolution of the Council of National Defense, passed on May 6, dealing with thrift and economy as a national measure, has been presented by the section to every State council of defense, urging them to use their influence to promote this as a national campaign. In response, the State councils have given the matter publicity through the press, through bulletin boards, and through the county and local councils of defense. This work has been supplemented by proclamations of the governors of several States calling upon every citizen to be economical. In some States the county councils have called meetings to consider what definite measures of economy should be adopted in their district.

In addition to this general program the section has conducted two specific campaigns for the return of unsold bread and for the curtailment of retail deliveries, campaigns which have wholly eliminated both types of wastage in nearly every State.

(For economy in solicitation of funds see Coordination and Supervision of Voluntary War Organizations.)

LABOR.

Owing to the change in the administration of the labor matters of the country and to the recent establishment of the War Labor Policies Board, which deals directly with all labor problems and national labor programs, no comprehensive general labor program has as yet been presented to the State councils by this section. However, in almost every State the United States Public Service Reserve Director was designated by the State council of defense and appointed by the United States Public Service Reserve of the Department of Labor. In many States a great part of the task of enlisting the reserve has fallen to the State councils. In several States the State councils also designated the United States Employment Service Director, and in other States associate directors were appointed by the State councils to cooperate with the United States Employment Service Directors.

Perhaps the most important activity of the State councils as regards labor was the campaign for the enrollment of shipbuilders, undertaken at the request of the United States Shipping Board. Thirty-five States adopted the suggestions of the State Councils Section for aggressive action and reported great success in obtaining laborers for the various shipyards.

The question of farm labor has been taken up, and this section has urged the State councils both to cooperate in every possible way with the Department of Labor and the farm-help specialists of the Department of Agriculture, and to frame constructive State programs to meet the farm-labor shortage. The response to these appeals has been vigorous. Labor surveys have been made by 16 States and various labor activities have been undertaken. In several States the councils induced employers to release employees who formerly worked on farms to help in times of emergency. Thirty-seven State councils took the major part in the organization of the United States Boys' Working Reserve, in which boys of from 16 to 21 years of age are enrolled for war work, and are now bearing almost the entire responsibility for the conduct of the reserve. A number of State councils have made definite plans to mobilize the townspeople to work on adjacent farms. Employment bureaus have been established in several States with a view to bringing together the labor demand and supply.

The State councils have taken an active interest in eliminating vagrancy, and the war-emergency compulsory-work laws of West Virginia and Maryland, for the enactment and execution of which the State councils were largely responsible, have become the parents of many similar laws elsewhere throughout the Nation. Certain State councils have induced local leaders to enact ordinances against vagrancy.

With the approval of the Bureau on Industrial Housing and Transportation of the Department of Labor, the section has sent out a bulletin dealing with State council activity to meet the housing needs of the State. The program provides for the arousing of each congested section to meet its own housing needs, the bringing together of all agencies interested in the solution of the housing problem, cooperation with the State and municipal health authorities, and the adaptation of publicity organizations of the State and local councils for launching and supporting the housing campaign.

The section transmitted to the State councils further suggestions from the Director of the Bureau of Industrial Housing and Transportation of the United States Department of Labor, urging them to make canvasses of room vacancies and to establish room bureaus in order to provide for better housing of war workers.

Other activities of the State councils in connection with labor problems deal with the arbitration of disputes, the arranging of convict labor for farm work, and the registration of the unemployed.

TRANSPORTATION.

In the early months of the war the State councils were called upon to take measures to relieve the railway congestion, and considerable attention was devoted to the matter. With the appointment of the Director General of Railroads the need for initial action on the part of the State councils was removed. Among the activities of the State councils in this branch of war work were a systematic campaign for the purchase of fertilizer in full car lots, the encouragement of quick loading and unloading, and the establishment of local priority systems.

The question of solving the transportation difficulties through the use of the highways has been given considerable attention by the State Councils Section, and thoroughgoing programs on highway construction and the promotion of motor-truck transportation which have been devised by the Highways Transport Committee of the Council of National Defense have been transmitted by the section at its request. The section is at present stressing the formation of highways transport committees by each State council to deal with the question of motor-truck transportation in each State with a view to preventing and relieving the freight congestion of the railways. As soon as these committees are appointed the detailed direction of their work is assumed by the Highways Transport Committee, which treats these local committees as its local agencies. The State councils have been urged to establish rural motor-express lines and to organize return load bureaus whereby trucks bringing loads into centers of population may be put in touch with freight which will provide a full load for the return trip. Twenty-six State coun-

cils¹ have organized special committees to carry out this program, and the matter is under consideration in other States where road conditions make such transportation practicable.

STATE DEFENSE.

Nearly all of the State councils have been active in the organization of home guards, often supplemented by automobile defense squads. When the entire militia was drafted into the Federal service property of military importance had to be guarded by the Federal authorities. There was also in many States an urgent need for creating a supplementary body which would provide a guard against enemy aliens and lawbreakers, and thus make it unnecessary to call upon the men trained for active military service. On the other hand, it was inadvisable for the States to form a new militia. To meet this situation the State councils, assisted by the State authorities, have formed home-defense guards. Special statutes providing for these home guards were passed by the legislatures of 19 States.

The State councils were also urged to take active measures for the prevention of fire, and general publicity campaigns have been carried out warning citizens concerning fire hazards and requesting that great care be exercised. The inspection of all industrial plants and food repositories by inspectors indorsed by the State council was recommended, together with a survey of the fire apparatus of every town to arrange for interchange of apparatus and to effect standardization of hose and hydrant coupling.

HEALTH.

The State councils have done important work in the maintenance of public health standards, in the mobilization of physicians, nurses, and hospital equipment, and in the correction of defects barring men from military service. The State committees of the Medical Section of the Council of National Defense are closely affiliated with the State councils, which have assisted in such of their campaigns as the recruiting of doctors for the Medical Reserve. The section has especially asked the assistance of the State councils in the educational campaign against venereal diseases in the civilian population, which is the source of infection of training camps. Material assistance has been rendered by many of the State councils by publicity measures and by the arrangement of meetings for drafted men as referred to in the paragraphs on military programs. At the request of the United States Public Health Service the section appealed to

¹ Alabama, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Florida, Illinois, Indiana, Kansas, Kentucky, Maryland, Massachusetts, Missouri, Nebraska, Nevada, New Jersey, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Virginia, Wisconsin.

the State councils to aid in strengthening the system of centralized morbidity reports, both to the authorities at Washington and to camp medical authorities.

The children's year program is being conducted under the supervision of the State divisions of the Woman's Committee of the Council of National Defense. The State Councils Section, however, has been in consultation with the committee formulating the program, and the State councils are cooperating closely in the campaign. They have already rendered assistance in the weighing and measuring drive and in the recreation campaign.

COORDINATION AND SUPERVISION OF VOLUNTARY WAR ORGANIZATIONS.

The State Councils Section has urged the various State councils, as the official war-emergency organizations of their States, to undertake the concentration of patriotic work, the coordination of all voluntary patriotic organizations in the State, and the supervision of the solicitation of funds for war relief by voluntary agencies. The coordination has been effected primarily through the leadership of the State councils in the specific fields of war work in which they have engaged. Some means of supervision of solicitation of funds has been undertaken by 39 State councils. Nineteen States have published lists of approved societies and 8 have delegated the chief responsibility to their county councils. In 12 States, including many of the former groups, some form of the war chest or budget plan is being used. Four State councils are empowered by law to exercise this supervision. The Council of National Defense does not itself approve or disapprove of any organization soliciting funds for relief, but at the request of the State councils it looks up and transmits information regarding such societies.

The American Red Cross and the Council of National Defense have through this section sent out to the State councils of defense and the Red Cross divisions a general letter calling attention to the work and activity of the two organizations and urging close cooperation. In the various war-fund campaigns especially, the American Red Cross has asked and received the assistance of the State councils of defense. In many cases the local council of defense has turned over its entire machinery to the local Red Cross committee during their drive. The section has, further, sent out to the State councils a request for cooperation with the Red Cross in the determination of the loyalty of the personnel of applicants for its overseas service.

COORDINATION OF FEDERAL AGENCIES IN THE STATE.

The State Councils Section has always urged the State councils to utilize existing machinery. At the same time, it has endeavored to prevent the creation of extra machinery to perform work which

could be accomplished through that of the State councils of defense and has urged the Federal departments and war administrations to work through the State councils of defense as far as possible. The section has endeavored to bring the local representatives of Federal administrations and departments in close touch with the State councils and through the State councils to bring them into harmony in the war work of the State. To this end and to prevent overlapping and duplication of effort, the State Councils Section has urged the adoption of a method which provides for the coordination of all Federal agencies operating directly within the State by the establishment of a war board, consisting of the State council officials and the State agents of the various Federal departments and war administrations. Thirty-three State councils¹ have already called war-board meetings, three have stated that they will hold them in the near future, while a number report that such close cooperation exists as to make them unnecessary. Fourteen of these State councils have made war-board meetings a permanent institution, and 18 State councils report that they have extended the system to the county councils. By this method all agents doing war work in the State meet regularly for informal round-table discussion of problems and programs.

WOMAN'S COMMITTEE.

During the year the work of the Woman's Committee has consisted in perfecting an organization throughout the States and developing the work of the departments within the committee. A member of the committee is in charge of each department, and in forming plans for the work in the State divisions the chairman of each department has kept closely in touch with those Federal departments or agencies whose work was represented in her department. Programs have been formulated to further the Government campaigns and to give publicity to the official plans for national defense as they concern women. In carrying on the work the committee has received from these governmental agencies most valuable assistance in the form of expert advice and suggestion.

The work of the departments is as follows:

STATE ORGANIZATION.

In order to fulfill the purpose for which the Woman's Committee was created it was necessary to form an organization which would reach the women—all of the women—of the country, to convince them of the need for their help and to direct their efforts to be of service

¹ Alabama, Arizona, Arkansas, California, Colorado, District of Columbia, Florida, Georgia, Idaho, Illinois, Iowa, Kansas, Kentucky, Maine, Maryland, Mississippi, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Vermont, West Virginia, Wisconsin.

to the country. It has been the work of the Department of State Organization to build up this machinery throughout the States. The task has been no light one. No single society had ever pretended to embrace all the women of the country; no Government agency had as yet done so.

The plan which the Woman's Committee followed is a simple one. In each of the 48 States, and also Alaska, Porto Rico, Hawaii, and the District of Columbia, the divisions of the Woman's Committee have been established to include every patriotic woman in the State or Territory. The women of each division are represented in a State committee composed of the heads of state-wide women's organizations and of representatives of women not connected with any organization. This State committee, through its executive committee and State chairman, has carried out in every State the subdivision of its organization into smaller units. Each division has created its local units to suit the needs of the locality. In the New England States the town is the dominating factor; in the West the county and township are the customary units. As a rule, in the larger cities wards and precincts have been organized, and groups of 10 to 20 women have been placed under "captains," who are responsible for reaching every woman under their care. The work of subdivision is being carried out rapidly; 4,410 subordinate units have been reported, including 2,538 counties, 8,590 cities, towns and townships, and 3,307 smaller units, such as school districts, wards, precincts, and city blocks. These figures by no means represent the total number of smaller units, since few divisions have definitely reported the number which are organized. Intensiveness of organization has not, of course, been achieved equally in all States, but at least 17 State divisions have established sufficiently complete machinery so that when any campaign is to be launched or Government message is to be sent out practically every woman in the State can be quickly reached.

The work of the committee is effected in the State divisions through departments corresponding to those of the Committee in Washington. For each department chairmen have been appointed in the State divisions, who receive directions from Washington, adapt the proposed plans to suit conditions in their own States, and carry on the work through the departments in their local units.

RELATION WITH STATE COUNCILS.

When the Woman's Committee was created there were already in existence a great many agencies for war work, and the problem of adjustment with these agencies has been a vital one. The most important relationship to be established has been that between the State divisions of the Woman's Committee and the State councils

of defense. Since the dividing line between men's and women's war work is so slight, the complete success of both the women's divisions and the State councils depends largely upon their working together harmoniously. Thirty-one States have recognized this fact by making the State chairman of the Woman's Committee a member of the State council. In States where there are no women members on the council various means of coordination have been effected. Officers of the two organizations sometimes hold joint meetings. In two instances the State chairman of the Woman's Committee is a member of the advisory committee of the State council, and in many cases the women's division is organized as a subcommittee or auxiliary of the State council. In many States the coordination between the men's and women's forces has been carried out in the smaller units as well as in the State council, and local chairmen of the Woman's Committee are members of the local councils of defense. The two organizations have worked together in the establishment of community councils, the women's division having cooperated with the State council in either formulating plans or actually establishing community councils in 37 States. On the whole the relationship between the State councils and the State divisions of the Woman's Committee has been genuinely cordial.

COORDINATION OF WOMEN'S SOCIETIES.

A second and quite different problem of coordination arose through the fact that many existing women's societies had already undertaken definite war work when the Woman's Committee was created, and that a number of women's organizations had sprung up since this country's entrance into the war, with purposes which in part duplicated those of the Woman's Committee, although the organizations lacked official standing. In order to do away with the resulting confusion, the Woman's Committee has brought together the heads of State-wide women's organizations in the State committee of each division, thus enabling the representatives of these organizations to learn directly what is required of women at the present crisis, and to make plans for using their societies in the most effective way. This cooperation is further carried out through reports made by heads of organizations in the States to the State committee of the women's division as to the war work which their societies are undertaking.

FINANCE.

The great difficulty which the State divisions have had to meet in effecting their organization has been the problem of finance. In 28 States the work has received financial support from the State, usually through the State council, but in most cases the amounts given have been quite inadequate. The women in these States, as well as those

where no State appropriation was forthcoming, have therefore resorted to a great variety of means to raise the necessary funds. Frequently the State chairman and other officers have paid their own expenses entirely; stenographic services have been donated; women's organizations and private individuals have contributed; county boards of supervisors have been asked to aid in supporting local units; in some States a small registration fee has been charged; and, in addition, large amounts have been raised by the women through all kinds of financial enterprises, from vending special editions of newspapers to selling "Liberty potato chips" on the street corners. In this connection the success of the Illinois division is so striking as to be worthy of mention. The reports sent in are by no means complete, but they show within the past eight months a sum of \$57,682 raised by women for the work of the committee. It is almost needless to say that the usual relation between the amount invested and the returns is fully demonstrated by the remarkable effectiveness of the Illinois division.

REPORTS FROM STATE DIVISIONS.

An effort has been made by means of questionnaires and forms for bimonthly reports to obtain reliable statistical information as to just what was being accomplished in each State. Constant insistence upon uniformity and accuracy in the use of these methods is having its result in a degree of genuine business efficiency which is extremely gratifying in an organization of such immense extent and varied activity, which has been in existence less than a year, and which is composed entirely of volunteers, few of whom have had experience or training along these lines of economic work.

During the year, in order to extend the organization and stimulate the activities of the State divisions, members of the committee have personally visited, sometimes more than once, 32 States, and 125 addresses have been made by committee members, explaining the work of the committee and urging upon women their national responsibilities. Officers of the State divisions from 36 States have made visits, often repeated, to the national headquarters.

At the close of the first year's work a conference was held at Washington May 13 to 15, at which there was an attendance of 245 State and department chairmen, representing 37 State divisions. Reports given at this time showed that the women of the country are undertaking the organized work for national defense with a most encouraging vigor, resourcefulness, and earnestness of purpose.

REGISTRATION.

The Department of Registration was created to direct the registration of women for voluntary service, so that definite information

might be secured as to what service the women of the country were able and willing to render in order to meet the present emergency.

An official registration blank was prepared with the assistance of the Census Bureau. This form has been used in those States where registration for service has taken place. It provides for a definite record of the training and capacity of the registrant and of her willingness to give service, either paid or volunteer, for full or part time. A desire for training in any specific branch of work is also recorded.

Registration had been undertaken in 24 States. In every case but one this registration has been entirely voluntary, although in 16 States official sanction was given through a proclamation by the governor. In Louisiana registration was declared compulsory by an act of legislature, but no penalty was attached for failure to comply with the law. In Connecticut no State-wide census was taken, but a very successful local registration occurred in New Haven, and one has just been taken in Waterbury. Other States are planning to begin registration as soon as the experience of those that have already conducted such a campaign can be compiled and analyzed and thus made available.

The procedure has varied with the local conditions of the respective States. In general, however, there have been three stages of progress: (1) Preparation, including the setting of a definite day or period of registration by governor's proclamation or otherwise, a general campaign of publicity, an analysis of local situations to determine the best methods of approach, and the training of registrars; (2) registration at booths in established places, in a house-to-house canvass, or both; (3) a summary of the information gained, and an effort to provide opportunity for every woman to render the service offered or to receive the training desired.

The thoroughness of preparation varied widely with the funds and organization at the command of the committee. In one State a most complete survey was made of the present occupations of women, the opportunities open to them, and the necessity for creating new opportunities for both service and training. In another conferences were held, both State wide and local, for much the same purpose. Particular pains have been taken to meet the situation in large cities where the foreign population is great.

Publicity began with instructions sent out by the national committee to the State divisions, and was continued in circular letters to local units and affiliated organizations, appeals through pulpit, school, and press, messages flashed on the movie screen, handbills distributed from door to door, and personal appeal in house-to-house canvass. In this way much of the ungrounded fear of the ignorant woman, who thought that the registration meant conscription, and the indif-

ference of the selfish woman, whose attention had not yet been turned to the service, was overcome.

Especial emphasis has been placed on the necessity for the registrar to understand not only the proper form for filling out the registration card, but also the best ways of meeting indifference or actual opposition. To provide for this need classes for registrars, in some cases through the State, in some cases in larger cities only, were provided in eight States.

Although in almost all instances a certain day or week was publicly proclaimed as the time for registration, in actual practice local conditions, such as wet weather, bad roads, or antiregistration propaganda, have in all cases led to an extension of time. In two States a record was kept of those refusing to register, thus making a more complete census than otherwise could be compiled. In several States provision is being made to carry on the work of registration indefinitely, thus meeting new calls for service as they arise.

PLACING OF REGISTRANTS.

It has been realized that the final test of registration lies in providing the registrants with real and immediate opportunities to serve. This problem is being handled especially well in Missouri, Illinois, and Pennsylvania. In each of these States employment service has been established in cooperation with the existing Federal and State employment agencies. In Missouri the plan is to have a combined registration, information, and employment bureau in every town of 5,000 population or over. In Kansas City and St. Louis these bureaus have already become effective. The Civil Service Commission appealed to the registration department of Kansas City for 250 stenographers. A call for 100 social workers was likewise filled. In Illinois two employment departments have been created, one to provide for women desiring to enter paid service, especially industry, the other for furnishing volunteer workers to social service and war relief agencies; 1,481 women were placed between the dates of February 7 and April 8, 1918.

Another problem has been the providing of training for candidates in many lines of work now being opened to women. This work was begun by the department of educational propaganda, but because of the close relation of training to employment, in most States it has been taken over by the department of registration. The courses offered vary from the regular classes of high school, business college, and university, enlarged and modified to suit the present need, to emergency classes established in settlement houses or other convenient centers in cities, or small evening groups in rural communities taught by some resident stenographer. These classes cover over

45 lines of endeavor, from business English to farming, from home nursing to motor driving.

Without question, whatever registration has been taken has proved of great educational value. The demand that they measure definitely the resources of time and ability which they could offer in the service of their country has awakened in many women a new idea of their responsibilities toward the Nation, and of their possible usefulness. It has opened opportunities for those who, because of physical limitations or isolated situation, had not previously been able to get in touch with patriotic activities. It has meant in practically every case an increase in the number of workers available for Red Cross and various social service agencies. As has been shown, it has in many States provided the machinery whereby a call for emergency workers, paid or volunteer, was immediately filled. Returns as to the perfection of this machinery and of the actual service thus rendered the Nation, are coming in day by day.

FOOD PRODUCTION AND HOME ECONOMICS.

ORGANIZATION.

The Department of Food Production and Home Economics includes the activities of the Woman's Committee which correspond to those of the United States Department of Agriculture, especially in its work with women. In order to strengthen the connection between the two agencies, the Secretary of Agriculture assigned a member of the staff of the Office of Home Economics to spend part of her time with the Woman's Committee in the position of executive chairman of this department.

Practically all of the State divisions have organized corresponding departments; 18 report that their States have complete local organization for this work, and 7 are more than 75 per cent organized. From the first these departments of the State divisions have been urged to cooperate closely with the home demonstration work of the Agricultural Extension Service carried on by the Department of Agriculture and the individual States in cooperation. This association has proved mutually helpful, the home demonstration agents providing a corps of professionally trained workers and the Woman's Committee using its own workers and prestige to increase interest in the home demonstration work. There has also been close cooperation with the home conservation work of the State organizations of the United States Food Administration, especially that carried out by its home economics directors. In the nature of things there is an overlapping in food conservation work of these three agencies, and in the first months of the work before the Federal organizations and the reasons for them were understood by State representatives there was some confusion among local committees and workers. This,

however, has gradually disappeared, and a system of real cooperation in food conservation activities has been worked out in nearly every State. This is sometimes secured by amalgamation of local committees; sometimes by having the same person on each of two or even all three agencies; sometimes by giving the State leaders adjoining offices.

In a few cases States have subdivided their work along slightly different lines from those laid down by the Woman's Committee in Washington. For example, several have separate departments for food production and a few have separate departments for home economics exclusive of food (i. e., household management and equipment, clothing and fuel conservation, etc.). Such departments are affiliated directly with the department of food production and home economics of the Washington office.

FOOD PRODUCTION.

The chief lines of activity in food production may be included under the headings of gardens, poultry, rabbits, and bee raising; also providing women for agricultural labor, or as substitutes in other suitable work now being done by men who might be more advantageously employed in agriculture. In many food-production enterprises, especially in rural districts, the Woman's Committee has been so closely affiliated with the home demonstration agents that it is impossible to separate the credit for results accomplished.

Organized work in promoting war gardens is reported from 33 States, in 14 under the Liberty garden plan suggested by this department. This plan pledges gardeners to cooperate with local garden supervisors or to work for the appointment of such officials where they do not already exist, and to report on results of the season's gardening. In its garden work the Woman's Committee has usually been in close touch with other recognized agencies promoting such undertakings. In April a field representative of this department made a lecture tour of 15 cities of New York State in which she emphasized the value of Liberty gardens, giving practical suggestions both for organization and for actual planting and care.

The question of relieving the agricultural labor shortage by the employment of women has been taken up in 20 States. Early in the winter the Woman's Land Army of America, which organizes groups of women to work in agriculture and provides suitable living accommodations for them, asked the cooperation of this department for the coming year. This department called the attention of its State chairman to the land army, and left to the individual States the decision as to whether or not formal cooperation with the land army was desirable, pointing out that agricultural and labor conditions vary so greatly in the different sections of the country that the desirability

of such work would vary also. It suggested that in deciding the question the State chairman consult the State director of agricultural extension, the farm-help specialist of the United States Department of Agriculture, and whatever other official agencies seemed concerned. Eleven States report active, and six proposed cooperation with the Woman's Land Army. As was to be expected, the work has made most progress in regions where the drain of labor into war industries is greatest and where intensive agriculture such as truck gardening or fruit growing is carried on, conditions which are at present found more in the northeastern States than in the southern and western parts of the country.

Ten States report organized effort to relieve farm keepers of part of the household labor, thus releasing the time to these women for increased production or making possible the caring for a larger number of farm laborers. In one fruit-growing State an interesting plan is developing by which city women feed the harvesting gangs from canteens opened near the orchards. In another State a questionnaire was sent to all rural school-teachers and high school graduates asking those willing to help in housework in the farmhouses during the busy summer season to state their special qualifications. The information thus received was turned over to the local office of the United States Employment Service.

FOOD CONSERVATION.

Because of the close affiliation between the Food Administration workers and those of this department, it is practically impossible to distinguish between their activities. Much of the work reported by the Food Administration Department represents the joint work of the two branches of the Woman's Committee. Formal reports sent in to this department show that 29 State departments have established community enterprises for the preservation of food by canning, drying, etc.; 31 give instructions in the preparation of food and the use of war substitutes, which in 23 cases include instructions in the nutritive value of foods.

The Washington office has suggested the importance of studying the local marketing conditions with an idea of possible improvement. The matter has been taken up in 20 States. In several, local farmers' markets and other simple food exchanges have been opened as the result of the Woman's Committee activities.

GENERAL HOUSEHOLD THRIFT.

This department from the first has been conscious that the necessity for work along the lines of general household conservation would probably increase as the war goes on, and has endeavored to keep the matter before its representatives. Eighteen State divisions re-

port activity in fuel conservation, usually in cooperation with the local fuel administration, and 15 work in clothing conservation. The machinery is well developed for a more active campaign in general thrift whenever this becomes necessary.

WORK OF THE WASHINGTON OFFICE.

This department, besides issuing a leaflet and pledge cards for "liberty gardens," has distributed posters, leaflets, and bulletins from the United States Department of Agriculture. A conference of State chairmen was held on February 22, at which 35 States were represented.

The department is about to conduct a survey of agencies for the sale of cooked foods to be consumed away from the place of sale. An advisory committee has been appointed consisting of eight members recognized as authorities on the subject, and a general plan of work has been made out. This includes a study of the institutions existing previous to the war in Europe and America, similar institutions developed by the war emergency abroad, and whatever shall have been done in this country. Emphasis will be laid on the way in which such enterprises are financed—whether on a commercial basis or supported wholly or in part by private or State funds, and the social and economic desirability of the different types. An attempt will be made to measure the comparative cost of materials, fuel, and labor of food prepared in the individual household and in large quantities. The further question will be considered as to whether removing the preparation of food from the home is economically and socially desirable, either as a war emergency, when the demand for women's labor outside of the home is exceptionally great, or under normal conditions, when the demand for labor is less urgent.

FOOD ADMINISTRATION.

The purpose of the Department of Food Administration is to further the program of the United States Food Administration by making it known to as large a number of women as possible and by educating an increasing number in its provisions.

COOPERATION WITH THE FOOD ADMINISTRATION.

The cooperation of the Woman's Committee in the work of the Food Administration was first sought by Mr. Hoover in a statement given to the press on June 17, 1917, in which he said, apropos of the first food drive:

Inasmuch as before the legislation is completed the Food Administration has no representatives throughout the country, the Council of National Defense is kindly requesting all of the State councils of defense, with the assistance of the Woman's Committee of the Council of National Defense, to undertake the registration.

Although the organization of the Woman's Committee was but just begun, the task which Mr. Hoover proposed was cheerfully undertaken. As a result of the first drive, 1,915,859 signed pledges were returned to Washington, practically all of them having been obtained through the efforts of the Woman's Committee. The committee everywhere cooperated in the second drive conducted in October by the Food Administration. The value of the work of the Woman's Committee in these drives has been repeatedly acknowledged publicly by Mr. Hoover.

When the Food Administration began organization in July, 1917, a home economics director was chosen in each State to head the home conservation work. As the Woman's Committee had already appointed in nearly every State a woman for the same task, it was decided that where practicable the same person be requested to act for both organizations. As a result of continued efforts to coordinate this leadership the amalgamation has been worked out successfully in 25 States. Where the leaders are not one and the same for the two organizations there is usually excellent cooperation.

As the directions and suggestions of the home conservation section of the Food Administration go out largely in bulletins and leaflets, it has been arranged that hereafter these issues will go direct from the State food administrator to county chairmen of the State divisions.

ACTIVITIES IN THE STATE DIVISIONS.

It has been found necessary in order to teach people how to substitute foods of proper nutritive value for those being saved for export, to carry on extensive campaigns of education. This has been done in many different ways, depending upon the resources and needs of the States. Demonstrators have been employed regularly in many localities to go to clubs, stores, schools, and houses. In many communities the demonstrators have gone with their equipment from point to point in automobiles. They have been present at county fairs, at city food exhibits and at many different kinds of public entertainments. Food exhibits have become permanent in many communities where the Woman's Committee is at work. The ingenuity and energy of the food chairmen in devising methods of explaining to the people how to substitute for the foods which the country was asked to save can scarcely be exaggerated.

The department has been equally active in its efforts to meet the situation which arises from local overproduction of food. More garden stuff and small fruits were produced in many communities last summer than the producers could use or distribute. This department of the Woman's Committee frequently organized forces to collect this surplus for canning or for sale with very satisfactory results. A similar task has been that of aiding local markets to dis-

pose of a glut of some staple product such as occurred in various States this spring in potatoes. Potato drives were organized, and great quantities disposed of through unusual selling devices.

TRAINED ASSISTANTS.

The work of the department of food administration in the State divisions will be strengthened in the future by the assistance of the young women trained in special emergency food courses inaugurated by the collegiate section of the Food Administration. As a result of these courses, given in 720 colleges and normal schools throughout the country, some 20,000 young women have reported for special food work and are available to assist in explaining the food program to the masses of the people. The Food Administration requested that the State chairman of the Woman's Committee be consulted in choosing the State leader to place the young women who had received certificates in these courses. The leader assigns the young women to duties in their various communities, and the Woman's Committee is free to call upon them for any service for which they are prepared.

COOPERATION WITH FEDERAL AGENCIES.

The complete cooperation between this department, the home conservation department of the Food Administration, and the home extension section of the Agricultural Department is so essential that the heads of these three Federal agencies have spent much time in trying to effect a satisfactory plan for coordinating their efforts. It is believed that the lines on which they are working will eventually lead to this necessary and desirable result.

WOMEN IN INDUSTRY.

WORK OF THE NATIONAL DEPARTMENT.

The Department of Women in Industry has devoted its efforts largely to interpreting to the women of the country the policy of the Government regarding the maintenance of standards for women in employment, as set forth by the President, the Secretary of War, the Secretary of Labor, and the Council of National Defense. Circulars emphasizing the importance of these standards have been sent to the State chairmen, together with copies of General Orders, No. 13, issued by the Chief of Ordnance. The importance of maintaining proper conditions for women workers was further emphasized through a circular to the honorary committee of the Woman's Committee, which consists of the heads of 80 nation-wide women's organizations; through dissemination of copies of the National War Labor Program, from the Department of Labor, and Woman's Work for the War, from the Ordnance Department; and through the

preparation of photographs and plans for exhibits, a Bibliography on Labor and the War, and a chronology of important events concerning women in industry since March, 1917. Newspaper publicity for the standards for women's labor adopted by the Government has been secured by articles widely circulated by the press.

The department has worked with the Committee on Women in Industry of the Advisory Commission on Labor of the Council of National Defense, but owing to delays in defining the respective functions of the two agencies in the States, departments of women in industry have not been organized in all State divisions of the Woman's Committee. At the present time the department has chairmen in 44 State divisions and is organized in local units in 14 divisions. A conference of State chairmen of this department was held at Washington in March and at the time of the annual conference in May a special session of chairmen of women in industry was called.

ACTIVITIES OF THE STATE DIVISIONS.

Owing to widely different economic conditions in the States, the activities reported by the State divisions are marked by the greatest variety. In eight divisions special publicity has been given to the standards adopted by the Government for war workers, the Illinois department having prepared an especially effective exhibit showing the false economy and disastrous effects of too long hours for women employees. In order to determine the extent and effects of replacement of men by women, 19 States have made industrial surveys. In two others an analysis of the draft figures has been undertaken to anticipate future calls for women workers. Five States have undertaken the recruiting of women workers and seven others have conducted employment bureaus working in cooperation with official agencies. Other typical activities include the establishment of training courses to prepare women for certain occupations in which there is a demand for their labor; investigation of conditions in industrial plants, chiefly those having Government contracts; initiation or support of remedial legislation; efforts to secure enforcement of laws already existing, and assistance in solving housing problems.

HOUSING COMMITTEE.

The problem of housing has also been taken up by the national department with regard to the situation in Washington. Through some of the clerks in the employment of the Government, the attention of the department was called to the fact that there was no point of contact between the Government agencies in charge of providing housing for Government employees, and the young women who were to live in the quarters provided. At the request of the clerks the executive chairman of this department called together representative

employees from the women in the Government offices, and a committee was formed to advise with the committee on living conditions of the Department of Labor concerning housing problems in Washington. Suggestions were drawn up to express to the Department of Labor the needs and wishes of the women workers in regard to housing.

PROPOSED WOMAN'S DIVISION.

A resolution urging the immediate establishment of a woman's division in the Department of Labor in accordance with the plan of his advisory council was adopted by the Woman's Committee on May 23 and communicated to the Secretary of Labor. The establishment of such a division will mean a more thoroughly defined field of activity for this department and a greater opportunity for service in bringing the program of the Labor Department to the women of the country.

CHILD WELFARE.

The experience of other countries involved in the war has shown that in time of war the ordinary needs of children are made more urgent and that certain needs present themselves which must be dealt with if national security is to be maintained. For this reason a Department of Child Welfare was felt to be a necessary part of the program for war work which the Woman's Committee was to provide.

The first activity of this department was to urge upon the State divisions their responsibility for making sure that the fullest benefit possible was being derived from the Federal child-labor law by exerting every effort to see that the children affected by it were not only not working, but were also in school. Twenty-seven chairmen have reported activity in encouraging school attendance and assisting in the enforcement of the law.

CHILDREN'S YEAR PROGRAM.

The conviction that a special child welfare program for the United States in war time was essential led the Child Welfare Department of the Woman's Committee and the Federal Children's Bureau to join forces in adopting the Children's Year program with the slogan, "Save 100,000 babies and give the children a square deal." A campaign to accomplish this end was launched to extend from April 6, 1918, to April 6, 1919.

The essentials emphasized in the Children's Year program are:

1. Public protection of maternity and infancy.
2. Mother's care for elder children.
3. Enforcement of all child labor laws and full schooling for all children of school age. Standards should be maintained in spite of war pressure.

4. Recreation for children and youth, abundant, decent, protected from any form of exploitation.

A suggested plan of organization for work in the States was drawn up and has met with an admirable response.

A very helpful element in launching the campaign was a conference of the chairman of the State child welfare committees, which was called together in Washington on March 12. Representatives from 17 States attended. Two days were devoted to consideration of the aims of the work and the practical questions involved in carrying out the program as a whole, and especially the weighing and measuring test, which was its first feature. The discussion did much to clarify ideas and to unify the work all over the country.

Anticipating the request embodied in a resolution adopted by the conference, the President, by a letter written April 3 to the Secretary of Labor, gave the Children's Year campaign his hearty indorsement. This letter was given wide publicity and furnished the desired impetus to the year's work.

WEIGHING AND MEASURING TEST.

The first work planned for the year was the weighing and measuring of children of pre-school age. Its purpose was to call wide attention to the health needs of the Nation's children, and to give a foundation of definite information on which to base the efforts of the year to improve health conditions. Leaflets giving information and suggestions as to this test and the program for the year were issued by the Children's Bureau and distributed by the Child Welfare Department through the State chairmen and the county and local chairmen of the Woman's Committee.

Cards for tabulating the records of individual children were furnished by the Children's Bureau. Orders for cards came in rapidly from the States, far exceeding the expectations of the Children's Bureau and the Child Welfare Department. At the end of the two months allotted for the test (April 6 to June 6) the number of cards at first estimated as sufficient, 500,000, had been increased to 5,500,000. Urgent requests still continued to come in, and the worth of the test as demonstrated in follow-up work of permanent value led the Children's Bureau to determine upon a further issue of cards. An additional 700,000 cards are now in process of printing and distribution. Forty-four States, the District of Columbia, and Hawaii have undertaken the test; two more States are to take up the work with the new issue of cards. Only two States are now without child welfare organization.

FOLLOW-UP WORK.

From the beginning it has been felt that the real proof of the value of the weighing and measuring test will be found in the permanent

measures of health betterment which follow as a result of it. Reports from the States already demonstrate that the weighing and measuring test is amply justified. Plans for increasing and improving milk supply, for securing perfect birth registration, regulation of the practice of midwifery, dissemination of information concerning child care, establishment of permanent infant welfare clinics, and employment of public health nurses are very generally under way throughout the country. This last mentioned measure—the employment of public health nurses—is being especially emphasized as undoubtedly the most effective means of saving the lives of children, which is the aim of Children's Year. At the request of the chairmen of the State child welfare departments, made at the conference in March, the national organization for public health nursing has prepared a plan for increasing the supply of public health nurses, which has been announced to the States. At least five States have already started State-wide campaigns for an increase in the number of public health nurses, and many other communities have raised funds or are making plans for this work. The follow-up work will, of course, grow rather than diminish throughout the year.

RECREATION DRIVE.

A definite recreation program for the summer months has been put under way as the second step in the Children's Year program. The Playground and Recreation Association of America has loaned the services of one of their experts to aid the Children's Bureau and the child welfare department in their plans. On June 6, 8, 13, and 14 representatives of Government departments and private organizations interested in promoting leisure-time activities were called together to give counsel for the recreation work. As a result of these conferences representatives of 14 organizations formed themselves into an advisory committee to the child welfare department and the Children's Bureau for the recreation drive. These organizations are ready to give technical advice to the State child welfare chairmen. They will also call upon their local branches to assist in the various communities in the States. General announcement of the plans for the campaign have gone out to the States, together with definite suggestions for the summer's work and for the "patriotic play week," which will give impetus to the summer's efforts.

At the end of its first year the child welfare department is in the midst of a definitely planned Children's Year program, with its first drive, the weighing and measuring test, an accomplished fact all over the country, its permanent follow-up work in full swing, and its second campaign, the recreation drive, just getting under way. The response of the patriotic women of the country organized for

the defense of the Nation to the war-time measures proposed for the protection of the children has been inspiring and remarkable.

MAINTENANCE OF EXISTING SOCIAL SERVICE AGENCIES.

The Department for the Maintenance of Existing Social Service Agencies was formed for the purpose of maintaining the same standards of social service activities during war time that have existed during peace. It was feared that contributors to the established charities might withdraw their support on account of their intense interest in new causes which are arousing the sympathies of the people. It was not the intention to organize new associations, but rather to make sure that existing agencies were covering the field thoroughly and to guard against any curtailment of the support necessary for the work of public-welfare agencies, such as day nurseries, civilian hospitals, district nurses, philanthropies, charities, and other recognized forms of social service. Forty-two divisions of the Woman's Committee have established departments to carry out this purpose.

This department has cooperated with the Committee on Nursing of the General Medical Board of the Council of National Defense in attempting to relieve the shortage of nurses by stimulating interest in nursing as a patriotic service, and in 15 States assisting in conducting the survey of nurses taken by the State Nurses' Association.

WORK IN THE STATE DIVISIONS.

In order to take up the work of this department intelligently 14 State divisions, following the suggestion from national headquarters, have taken a survey of philanthropic agencies. The answers to the questionnaires sent out showed that few social agencies are suffering from diminished financial support, but that practically all are crippled through the loss of trained workers, many of whom have entered service in connection with the Army here and abroad.

In order to meet the shortage of trained workers this department in many States has either secured the establishment of courses of instruction for social service workers or has brought to the attention of the public those already established. Opportunities for service have been advertised, and in those States where registration has been taken the registration cards have been drawn upon to provide volunteer workers.

A brief review of some of the more noteworthy activities reported from the State divisions includes the distribution of contributions which the Belgian Relief Association had been unable to utilize; in Chicago the issuing of a social service directory, giving a simple classification of social service agencies and telling how to use them;

supplying material and organizing groups of workers for the Red Cross in institutions, such as the infirmary and penitentiary; determining the available number of hospital beds in a large port city with a view to expanding hospital facilities to meet the increased demands when wounded soldiers are returned; examining and selecting 100 nurses to be commissioned as lieutenants in the home guard of the State; and conducting a bureau of volunteer service for the placement of volunteer social workers.

HEALTH AND RECREATION.

The purpose of the Department of Health and Recreation, originally called "Department of safeguarding of moral and spiritual forces," is to cooperate with the Commission on Training Camp Activities in providing for the protection of health and for facilities for recreation in camps and camp vicinities for men in military and naval service, and for young women as well. This department has been established in 47 divisions of the Woman's Committee, and in 12 States special vice chairmen for camps have been appointed.

SERVICE IN CAMPS.

The work in the State divisions has consisted chiefly in lending aid wherever possible to the Commission on Training Camp Activities and other organizations interested in the welfare of men in service, such as the Y. M. C. A. and Y. W. C. A. In many States this department has arranged or helped to arrange entertainments at the camps, provided chaperonage and supervision for these gatherings, assisted in maintaining canteens, collected books and magazines for the war libraries, and helped to secure hospitality for men in service in homes about the camps.

In order to combat the vicious elements which tend to become prevalent in camp communities the department of health and recreation in many cases has appealed to the authorities for more protective officers and especially for more policewomen, has been instrumental in securing detention homes for women and girls, and in having lectures on social hygiene given, in order to secure an intelligent public understanding of this subject.

WORK FOR GIRLS.

Recognizing the fact that some outlet for the vitality of girls and some guidance of their energies is especially necessary in these abnormal times if their relation to our men in service is to be helpful, this department has in many places actively cooperated with the Y. W. C. A. in establishing patriotic leagues for girls, and has taken other steps to provide young women with wholesome recreation and pa-

triotic work, to secure through lectures and classes a sane understanding of life, and to maintain allegiance to the highest ideals of conduct.

EDUCATIONAL PROPAGANDA.

The Department of Educational Propaganda began its organization nine months ago, and now has its special chairman in every State in the Union, save two, and in Hawaii and the District of Columbia. It also has chairmen in a large proportion of the county units of the State divisions. It has been very fortunate in the personnel of its chairmen and has among them a number of active, competent women of national reputation as educators and speakers.

Because of evidence of widespread ignorance concerning the reasons why we are at war and what winning or losing will mean to the Nation, the department has concentrated its activities very largely on education bearing directly on the questions involved in the war. It has endeavored, however, to do this in a broad way, believing that all the educational interests of the country are now closely bound to the winning of the war and that no education that is worth while can be carried on unless the people are in sympathy with the aims and ideals of the country. It has, therefore, directed a part of its work to regular school channels.

The general plan of the work of the department has been to hold as many State-wide meetings as possible; to follow these up with county and community meetings; to help to direct the study and talk of all clubs and organizations and gatherings of women into channels leading directly to constructive war work; to assist in bringing foreign women into an understanding of American ways and ideals; and to work to instill everywhere a spirit of enthusiastic and active patriotism.

SPEAKERS.

In such a work a primary requisite is clear and convincing speakers. The training of speakers and the formation of a speakers' bureau in every State has, therefore, been constantly urged, with the result that 33 States now have such bureaus in operation. In 22 States there are speakers' bureaus whose lists include from 30 to over 100 speakers, and chairmen report regularly to this department. Ten other States have a large body of competent speakers, who are organized jointly with the speakers' bureaus of their State councils. In one State the chairman of the joint bureau is a woman.

The department has a list of something more than 20 women in the various States who are national speakers and will give their services as speakers outside their own States. In addition to the State bureaus, there are, under various names, a number of smaller organizations whose work in clubs and public meetings corresponds to that of the Four Minute Men in the movies and theaters. All of

these women are rigorously held to concise and convincing speaking and are entitled to the name they have adopted in several States—Three Minute Women.

All over the country almost a continuous series of patriotic meetings is being held with the help of these speakers' bureaus. A State-wide meeting has been held in nearly every State, and most of the divisions had many such meetings. At about 50 of these meetings special speakers have been furnished by the headquarters of this department, but the excellent work of the various speakers' bureaus is rapidly diminishing the calls for national speakers.

The department has urged the States to have training classes for speakers, and especially to have them in the summer schools so as to have the rural teachers who attend these schools more or less prepared to help form a correct public opinion concerning the war in their communities. There are about 30 such classes now at work. In addition to these classes several of the States have already instituted training schools for their regular list of speakers with most satisfactory results. Pamphlets and suggestions for speakers have been furnished by this department, on request, to about 2,300 speakers.

LITERATURE.

In support of the work in the States this department has sent out more than 500,000 pamphlets and bulletins. It has also had prepared a special outline of topics for study, over 20,000 copies of which have been sent on request to libraries, clubs, and individuals in the States and in Hawaii, Porto Rico, Canada, Australia, New Zealand, the Philippine Islands, and to groups of Americans in China. The department has also sent out lists of topics (with bibliographies) for patriotic speeches, long and short, and for commencement themes.

It early became evident that if the country was to be solidly patriotic it would be necessary to have its aims and ideals and practical problems the subject of neighborhood discussion in the smaller communities. The department therefore undertook an experiment in rural meetings, with a view to asking the States to take the work up if it proved valuable. With the loyal cooperation of the rural teachers in a few counties in widely separated States it has held up to July 1 more than 200 meetings in rural school houses in communities of from 10 to 40 families. In small groups over 30,000 people have been reached by these meetings. More than 1,200 adults have spoken at them; 60 per cent of all the pupils have taken part in them by recitations, dialogues, and singing, and after the meetings the pamphlets, short speeches, and material for recitations which were sent to the teachers have been passed around for neighborhood discussion. The teachers gave most valuable aid in this

work. In answer to a somewhat full questionnaire, they have enabled the department to get a fair idea of the state of mind of the various neighborhoods. In some cases a very tangible improvement in the morale of certain communities has resulted. The entire experiment was such an undoubted success that the States have been asked to continue the work intensively.

AMERICANIZATION.

This department recognizes the vast importance of bringing the foreign-born people into a fuller understanding of, and consequent sympathy with, American thought and ideals. Since the Council of National Defense indorsed the plan of Americanization proposed by the Bureau of Education, this department of the Woman's Committee has joined with the State Councils Section in doing everything possible to promote uniform activity on this Federal plan and to further in every way the work of making our foreign peoples a united body of Americans. The bulletins sent out have called for a joint committee of men and women in each State for this work; have asked the establishment of a State-wide war-information service for immigrants; have suggested ways of working in industrial plants; have discussed ways of reaching German-speaking people, and have offered suggestions and assistance in naturalizing foreigners.

The women of the country have responded eagerly to the opportunity to engage in this work. This department had requests for nearly 30,000 "America First" pledges to help in the work. Nearly this many have been sent out, and they are returning daily, signed, and designating the work which the signer is able to do.

LIBERTY LOAN.

The Department of Liberty Loan was organized to assist in the sale of Liberty bonds, and has since taken up, in many State divisions, the sale of war savings stamps as well.

COOPERATION WITH NATIONAL WOMAN'S LIBERTY LOAN COMMITTEE.

At the time the first bonds were offered for sale the Treasury Department recognized the fact that the women would help greatly in the work, and accordingly organized the National Woman's Liberty Loan Committee. On this committee were two women who were also members of the Woman's Committee of the Council of National Defense. The two committees agreed that the National Woman's Liberty Loan Committee should nominate to the Woman's Committee, for transmittal to the executive committee in each State division, a candidate for the chairmanship of the Liberty Loan department of

the State division. The Liberty Loan woman chairman in each State was to work under the direction of the National Woman's Liberty Loan Committee, but a report of the work was to be submitted to the executive committee of the State division of the Woman's Committee and to the chairman of the Federal reserve district in whose territory the State was included.

At the time of the second drive the organization of the Woman's Committee in the State divisions was well under way, and this machinery formed a direct avenue from the Treasury Department and the National Woman's Liberty Loan Committee to the women in the towns. The Liberty Loan chairmen representing the two national committees proceeded to organize county and local committees for the sale of Liberty bonds. As no distinctive mark was used to denote bonds bought or sold by the women, the exact amount of their sales can never be known. The National Woman's Liberty Loan Committee has, however, reported the total amount subscribed and through women, "actual account," in 36 States as \$214,214,077.

At the time of the third drive the Woman's Committee was prepared to render much more effective assistance through the further extension of organization which had been accomplished, through the news departments which were able to aid in furnishing publicity in the State divisions, and through the well-established speakers' bureaus which were at the service of the Liberty Loan committee in many States. Since the Liberty loan chairmen of the Woman's Committee were also chairmen for the National Woman's Liberty Loan Committee and reported the total number of bonds sold by women, making no distinction—if that were possible—as to the amount which was due to the Woman's Committee organization, no figures can be given to indicate the part which the Woman's Committee played in this drive. However, 21 State divisions report the activity of the Woman's Committee organization as such in selling bonds.

THRIFT STAMP CAMPAIGN.

The Liberty Loan department in many States has continued after the close of the campaigns and conducted sales of war saving stamps and thrift certificates; 17 divisions report this activity.

HOME AND FOREIGN RELIEF.

As the name indicates, the Department of Home and Foreign Relief is concerned not only with the comfort and aid rendered the soldier in the field—whether of the American or allied armies—but also with succor for the soldier's family both in this country and in Europe. This department works almost entirely in connection

with established war-relief agencies, its function being to stimulate activity by bringing the women of the several States into touch with such organizations. Relations with the Red Cross are particularly close, although the State and local divisions try to give every assistance possible to all societies doing relief work.

ASSISTANCE TO AGENCIES FOR RELIEF.

This assistance consists largely in placing the machinery of the Woman's Committee at the command of various organizations. Through their facilities for publicity the State divisions have furthered such projects as the collection or making of garments for refugees, the adoption of the French orphans, or the rehabilitation of war-swept villages. Raising money for relief work, especially that of the Red Cross and the Young Men's Christian Association, has been a regular part of the program of the department of home and foreign relief in the majority of States. In many States Red Cross membership has also been materially increased by its efforts. For instance, in a certain southern city the ward organization was effectively used to add, in a single drive, 7,000 new names to the Red Cross roster. Another State reports that the establishment of the Woman's Committee has, in several counties, meant the beginning of Red Cross work in these localities. In two cases, at least, local committees have acted as intermediary between the Red Cross and foreign-born women, in one instance securing permission for groups of Italian women to mark their work as intended for use at the Italian front, in the other translating knitting directions into Danish and thus bringing in a number of very efficient workers. To the Home Service Section of the Red Cross, this department has also, in some instances, been of considerable assistance in that the local workers of the Woman's Committee have been able to spread correct information as to allotments or war-risk insurance, or to call attention to those in need of advice or relief.

OTHER PROJECTS.

Of the independent projects of the Department of Home and Foreign Relief the most noteworthy have been in connection with providing hospital facilities. A plan is being formulated in one State to turn an abandoned barracks into a reconstruction hospital, and thus bring into service a large number of resident nurses who are not able to work outside of their own community. In an eastern seaboard State a commonwealth armory has been fitted up so that it can, in a few hours, be converted into an emergency hospital; 100 trained nurses have also been recruited, subject to call for this project.

NEWS.

PUBLICITY FROM THE NATIONAL DEPARTMENT.

The News Department of the Woman's Committee was established in July, 1917. It began its activities by giving out to the daily, weekly, and monthly press articles explaining the purpose of the Council of National Defense in calling the committee into being, its relation to the Government, and the plans of organization, and of work. It has been found necessary to continue these articles of explanation both in this country and abroad. Interest in the work of the committee has developed in foreign lands, and articles on the purpose and the activities of the committee are not infrequently asked by foreign periodicals.

As soon as the State divisions of the committee began operations reports of their activities were regularly given out to the press by this department. A conservative estimate of these articles shows that the department has averaged at least one and a half articles a day since its organization. The life of these articles is sometimes surprisingly long. The clipping bureau not infrequently shows that a press release of last fall is still circulating.

Magazine publicity has increased and at least 50 articles have appeared in first-class weekly and monthly periodicals. These articles were either prepared in the department or from material furnished by it. A number of writers and editors come regularly to this department for material.

The News Department has believed that its first obligation was to keep those who had taken up the work of the committee informed of the progress of the work, both in Washington and in the State divisions. To this end it has published regularly a News Letter, which gives a survey of the committee's activities the country over. The first number of this News Letter appeared September 14, 1917, a three-page mimeographed sheet. The edition was but a few hundred, and it had no set date of publication. The News Letter has since become an 8-to-12 page bulletin, published twice each month, and its circulation is now about 20,000.

NEWS DEPARTMENTS IN THE STATE DIVISIONS.

As the work grew in the States it became clear that each State must have its own news department for the purpose of adapting the news to local needs and to keep the national news department informed on State activities. These departments have been established in 44 different States. They are rapidly forming county organizations, which adapt the news to local needs.

The work both in the State and county is carried out largely along lines laid down by Washington. Most of the State news chairmen regularly supply leading papers with material on the work of

the committee, and in two States the department prepares items for the "boiler-plate" service for rural papers. The news chairman in Porto Rico translates into Spanish for publication in the newspapers all circulars and letters from Washington. In 13 States news letters or bulletins are published by the woman's division. In 27 States news of the Woman's Committee appears in the bulletin of the State council of defense, the material published frequently taking a large proportion of space.

In some States the news chairmen have shown the greatest resourcefulness and ingenuity in furthering the work of the departments. Typical activities in the State divisions include a "Camouflage Meat Contest," the publication of a conservation recipe book, the use of movies to advertise registration and the child welfare campaign, a poster contest, and the establishment of an information bureau to provide material for speakers and other inquirers on all kinds of war subjects.

The duties of the news departments have been greatly increased by the work of the committee in special drives such as that for the Children's Year. The largest service the department is able to give in these campaigns with its present machinery is preparing for the State news chairman material and directions which they in turn distribute to their county chairmen. The publicity obtained through this organization has been enormous in the case of the Children's Year, and it is believed that when the organization of the news department is complete it will be possible to reach practically every woman in the country who reads newspapers.

FOREIGN NEWS BUREAU.

One of the first undertakings of the News Department was the creation of a foreign bureau to collect from different sources news of the war conditions and activities and problems of women in other lands. The interest and energy with which this bureau has been directed has resulted in the collection of a large amount of material. It is being kept up to date and is being classified and filed in Washington according to the department of the committee's work on which it bears.

The material of this bureau has been used in the news letters and in the press releases, as well as by writers gathering material for articles. The interest in it has led to the publishing of a monthly installment of foreign news. The first of these installments appeared in June, 1918, and is devoted to "Women in Industry." The succeeding installments will be devoted to different departments of the committee's work, as the material collected makes it possible.

The art section of the News Department has carried out for the committee several special pieces of work. One of these was the illumination of the letters of sympathy sent by the Woman's Committee to the Queens of Roumania and Belgium.

A war library was included in the original plans of this department. Thanks to the friendliness of publishers, some 80 volumes on the war have now been acquired, as well as a very much larger number of pamphlets. The library department has prepared a bibliography on the work of women in the war of over 1,000 titles. These have been classified according to their bearing on the various departments of the committee's work. The bibliography is now in the hands of the printers.

SPECIAL WORK.

In addition to the specific work of the regular departments, the Woman's Committee has responded to the requests for assistance which have been made on occasions by governmental Departments.

SECURING GOVERNMENT WORKERS.

At the request of the Civil Service Commission, in October, 1917, the Woman's Committee, through the women of the State divisions, advertised the need for clerical help in the different Departments in Washington. Since the responses were made to the Civil Service Commission, no statistics are available as to the returns from this campaign; but applications were received far in excess of the number of positions open, and an expression of thanks came to the Woman's Committee from the Civil Service Commission for the aid which the committee had rendered in solving this problem.

In a similar way requests for assistance in supplying Government workers have been taken up by the committee from time to time, the most notable case being the recruiting of clerks for the supply division of the Ordnance Department. This Department asked the assistance of the Woman's Committee in securing 90 college graduates for clerical positions. The committee made known the need in certain colleges through the country, and as a result received over 1,500 applications, which were referred to the Ordnance Department. Some 479 positions, including the 90 for which the movement originated, were filled from these applications.

COMMERCIAL ECONOMY BOARD.

Another service rendered was the assistance given to the Commercial Economy Board of the Council of National Defense in the attempt to reduce the number of deliveries. The object was to release men for other service and to assist in the general economies concomitant with fewer deliveries. Again the response was very general, and the State chairmen of the Woman's Committee have reported public meetings and newspaper publicity to create public sentiment in the direction of this economy. In some instances special meetings with merchants were held for the purpose of working out a cooperative plan of delivery.

SHIPBUILDERS' CAMPAIGN.

Acting on the request of the Shipping Board for cooperation, the Woman's Committee of the Council of National Defense telegraphed to the chairman of every State division to enlist the help of all the women's organizations in enrolling men for shipbuilders by announcing the fact that the Government was in need of skilled mechanics for shipbuilding. The response was gratifying, and the Woman's Committee in the States assisted the State council in the enrollment of men for shipbuilding.

STUDENT NURSES' CAMPAIGN.

In order to meet the serious threat of a shortage of trained nurses, the Woman's Committee, with the cooperation of the Surgeon General of the United States Army, the Surgeon General of the United States Public Health Service, the American Red Cross, and the General Medical Board of the Council of National Defense, is preparing to conduct a campaign to recruit 25,000 student nurses for the Army and civilian training schools. The actual recruiting of this Student Nurses' Reserve is to be carried on through the State and local organization of the Woman's Committee during the two weeks from July 29 to August 11.

INFORMATION DEPARTMENT.

The Information Department was created in January, 1918, for the purpose of centralizing in Washington all information relating to the Woman's Committee and its State divisions. In order to supply a complete and accurate account of the work, this department records and tabulates, from bimonthly reports of the State divisions, from news clippings, and from the correspondence of the committee, all available data as to the work in the State divisions. From its files it is able to furnish complete reports upon the work of any State, or upon the work of any department as it has been carried out in the several State divisions.

Information as to the extent and organization of the Woman's Committee at Washington, and through the States, has been incorporated in a book of charts, which has proved most useful in explaining and extending the work of the Woman's Committee.

The more easily to answer the numerous questions that come from women who are eager to serve their country, this department has issued a booklet, "War Work for Women," in which are listed the many opportunities for service—paid or volunteer, at home or abroad—which are now open to women. More than 20,500 copies have been sent out. This booklet has just passed through a second edition which in bulk triples the first, and additional material is being filed for a third edition.

NATIONAL RESEARCH COUNCIL.

(Department of Science and Research of the Council of National Defense.)

ORGANIZATION OF COUNCIL.

The preliminary steps in the organization of the National Research Council may be briefly recapitulated. In April, 1916, when the attack on the *Sussex* had greatly increased the tension of our relations with Germany, the National Academy of Science voted to offer to the President of the United States its services in organizing the scientific resources of the country. This offer was immediately accepted. The President expressed the desire that the academy should coordinate the scientific resources of the entire country and secure the cooperation of all agencies—governmental, educational, and industrial—in which research facilities are available. He also emphasized the fact that the chief national advantage of such cooperation and coordination would come after the war and that its most lasting effect would be seen in scientific and industrial progress.

The National Research Council, comprising the chiefs of the technical bureaus of the Army and Navy, the heads of Government bureaus engaged in scientific research, a group of investigators representing educational institutions and research foundations, and another group including representatives of industrial and engineering research, was accordingly constituted by the academy with the active cooperation of the leading national scientific and engineering societies. On July 24, 1916, President Wilson addressed a letter to the president of the National Academy expressing his approval of a preliminary report regarding the National Research Council and promising his cooperation and that of the various departments of the Government.

On February 28, 1917, the Council of National Defense passed a resolution expressing its recognition of the fact that the National Research Council, at the request of the President, had organized the scientific resources of the country in the interest of national defense and national welfare, and requesting the Research Council to cooperate with it in matters pertaining to scientific research for national defense. As a result of this action the chairman of the Council opened offices in the Munsey Building at Washington in March and entered into active cooperation with the Council of National Defense, which was then established in the same building.

Soon afterwards the Research Council was requested to act as the Department of Science and Research of the Council of National Defense, in which capacity it has continued to serve for the organization

of investigations on military and industrial problems and, in harmony with the expressed wish of the President as a coordinating agency in the field of science and research.

A further extension of the duties of the Research Council occurred in July through the acceptance of the request of the Chief Signal Officer, expressed in the following letter:

WAR DEPARTMENT,
OFFICE OF THE CHIEF SIGNAL OFFICER,
Washington, July 2, 1917.

DR. GEORGE E. HALE,
Chairman National Research Council,
Munsey Building, Washington, D. C.

MY DEAR DR. HALE: In the Signal Corps questions involving the selection and organization of large numbers of scientific men and the solution of research problems are constantly arising. The National Research Council, organized at the request of the President and acting as a department of the Council of National Defense, in close cooperation with similar bodies abroad, has federated and coordinated the scientific resources of the country and concentrated them upon the solution of military problems. It is accordingly the one agency in a position to meet the present needs of the Signal Corps.

I therefore request the Research Council to act as the advisory agent of the Signal Corps in the organization of its various scientific services and the solution of research problems. To this end I would suggest that Dr. Robert A. Millikan, vice chairman and executive officer of the Research Council, apply for a major's commission in the Officers' Reserve Corps, for detail in charge of this work.

Very truly, yours,

GEORGE O. SQUIER,
Brigadier General, C. S. O.

In accordance with this request Maj. (now Lieut. Col.) Millikan and Maj. Mendenhall were commissioned in the Signal Corps, and the work of the science and research division of the Signal Corps was immediately undertaken, as explained in a later section of this report.

THE RESEARCH INFORMATION COMMITTEE.

Since that time the relations of the National Research Council with the various departments of the Government have rapidly developed. This has been helped greatly by the establishment and organization in January, 1918, of the Research Information Committee, with offices in Washington, London, and Paris.¹ The importance of this step, which should have direct influence upon international cooperation in scientific research, especially if the position of scientific attachés of our embassies abroad can be maintained after the war, is such as to warrant the following detailed statement regarding the organization and work of the Research Information Committee:²

¹ At the request of the Italian Government an office is now also being established in Rome.

² Statement issued in February, 1918.

1. By joint action the Secretaries of War and Navy, with the approval of the Council of National Defense, have authorized and approved the organization, through the National Research Council, of a Research Information Committee in Washington, with branch committees in Paris and London, which are intended to work in close cooperation with the offices of the Military and Naval Intelligence, and whose function shall be the securing, classifying, and disseminating of scientific, technical, and industrial research information, especially relating to war problems, and the interchange of such information between the allies in Europe and the United States.

2. In Washington the committee consists of, first, a civilian member representing the National Research Council; second, the Chief, Military Intelligence Section; and, third, the Director of Naval Intelligence. Similar committees are being organized in Paris and London.

3. The initial organization of the committee in Paris is:

- (a) The scientific attaché, representing the Research Information Committee, Dr. W. F. Durand, attaché;
- (b) The military attaché or an officer deputed to act for him;
- (c) The naval attaché or an officer deputed to act for him.

4. The initial organization of the committee in London is:

- (a) The scientific attaché, representing the Research Information Committee, Dr. H. A. Bumstead, attaché;
- (b) The military attaché or an officer deputed to act for him;
- (c) The naval attaché or an officer deputed to act for him.

5. The chief functions of the Foreign Committees thus organized are intended to be as follows:

- (a) The development of contact with all important research laboratories or agencies, governmental or private; the compilation of problems and subjects under investigation; and the collection and compilation of the results obtained.
- (b) The classification, organization, and preparation of such information for transmission to the Research Information Committee in Washington.
- (c) The maintenance of continuous contact with the work of the offices of military and naval attachés, in order that all duplication of work or crossing of effort may be avoided, with the consequent waste of time and energy and the confusion resulting from crossed or duplicated effort.
- (d) To serve as an immediate auxiliary to the offices of the military and naval attachés in the collection, analysis, and compilation of scientific, technical, and industrial research information.
- (e) To serve as an agency at the immediate service of the commander in chief of the military and naval forces in Europe for the collection and analysis of scientific and technical research information and as an auxiliary to such direct military and naval agencies as may be in use for the purpose.
- (f) To serve as centers of distribution to the American Expeditionary Forces in France and to the American naval forces in European waters of scientific and technical research information originating in the United States and transmitted through the Research Information Committee in Washington.
- (g) To serve as centers of distribution to our allies in Europe of scientific, technical, and industrial research information originating in the United States and transmitted through the Research Information Committee in Washington.

- (h) The maintenance of the necessary contact between the offices in Paris and London in order that provision may be made for the direct and prompt interchange of important scientific and technical information.
- (i) To aid research workers or collectors of scientific, technical, and industrial information from the United States when properly accredited from the Research Information Committee in Washington, in best achieving their several and particular purposes.

The natural development of the work of the Research Information Committee will lead to the concentration in the office of the National Research Council, where the Washington headquarters of the committee is established, of all available information regarding research problems under investigation both in the United States and abroad. At the same time a service is being developed for the purpose of bringing properly accredited inquirers into touch with existing sources of scientific, technical, and engineering information in the United States. A central office from which inquirers may be directed to Government bureaus and other places where much information of this character is already available has long been needed, and it is probable that the services of the Research Information Committee, once well organized, will be in increasing demand.

In this same field of supplying information on scientific, technical, and engineering subjects, the work of the Research Council has already been developed in several different directions. For example, a subcommittee of the geology committee, consisting of one geologist and one highway engineer from each of the 19 States extending from Maine to Texas, has collected a very large body of information regarding materials for rapid highway construction along the coast. The elaborate report of this committee, bound, in seven volumes, with three atlases, has already been of considerable service, not merely from the standpoint of those interested in highway construction for possible military purposes, but also to the Shipping Board in connection with the problem of building concrete ships, for which the stone quarries described in the report are often adapted. In another field the work of the botanical raw-products committee has supplied extensive data relating to raw products required by industries, especially in cases where imports have been affected by the war. In still another field the Research Council has been called upon to cooperate with the War College in supplying information relating to topographical, geographical, and related subjects. Without mentioning other cases in which the aid of the Research Council has been sought for the purpose of supplying technical information, it is clear that this function of its work, not only during the war, but after its conclusion, is likely to undergo extensive development. Problems are constantly arising in scientific research and in the industries which have been already solved, though the solutions

are buried in the extensive technical literature so effectually as to render them practically inaccessible, even to those having large libraries. In Germany this difficulty has been met by establishing similar centers of information regarding scientific and technical questions, through which the desired advice and assistance can be obtained.

THE NEW WAR ORGANIZATION.

Until early in 1918 the work of the council was in the hands of a number of committees composed largely of men not resident in Washington and therefore not in close touch with the problems constantly arising under war conditions. For this reason it was decided to effect a new war organization by grouping these activities into divisions in charge of men who could spend a large portion of their time on the work of the council in Washington.

On May 11, 1918, the President of the United States issued the following Executive order:

The National Research Council was organized in 1916 at the request of the President by the National Academy of Sciences, under its congressional charter, as a measure of national preparedness. The work accomplished by the council in organizing research and in securing cooperation of military and civilian agencies in the solution of military problems demonstrates its capacity for larger service. The National Academy of Sciences is therefore requested to perpetuate the National Research Council, the duties of which shall be as follows:

1. In general, to stimulate research in the mathematical, physical, and biological sciences, and in the application of these sciences to engineering, agriculture, medicine, and other useful arts, with the object of increasing knowledge, of strengthening the national defense, and of contributing in other ways to the public welfare.

2. To survey the larger possibilities of science, to formulate comprehensive projects of research, and to develop effective means of utilizing the scientific and technical resources of the country for dealing with these projects.

3. To promote cooperation in research at home and abroad in order to secure concentration of effort, minimize duplication, and stimulate progress; but in all cooperative undertakings to give encouragement to individual initiative as fundamentally important to the advancement of science.

4. To serve as a means of bringing American and foreign investigators into active cooperation with the scientific and technical services of the War and Navy Departments and with those of the civil branches of the Government.

5. To direct the attention of scientific and technical investigators to the present importance of military and industrial problems in connection with the war and to aid in the solution of these problems by organizing specific researches.

6. To gather and collate scientific and technical information at home and abroad in cooperation with governmental and other agencies and to render such information available to duly accredited persons.

Effective prosecution of the Council's work requires the cordial collaboration of the scientific and technical branches of the Government, both military and civil. To this end representatives of the Government, upon the nomination of the National Academy of Sciences, will be designated by the President as members of the Council, as heretofore, and the heads of the departments immediately concerned will continue to cooperate in every way that may be required.

WOODROW WILSON.

THE WHITE HOUSE, May 11, 1918.

FINANCIAL SUPPORT.

Rapid progress was hindered for several months by the fact that the membership of the committees was widely scattered, while the very limited funds at the disposal of the Council prohibited any considerable concentration of its work in Washington. Under such circumstances the results obtained by the various committees during the preliminary period may be regarded in most cases as satisfactory. It was recognized, however, that as soon as conditions might permit, an improved organization, concentrating the work in Washington in immediate contact with the various departments of the Government and securing the necessary coordination of the work of committees dealing with closely related subjects, would be essential. The realization of such a plan, however, necessarily depended upon the financial position of the Council.

The appended statement indicates in detail the present resources of the Council, including also those of the science and research division of the Signal Corps, since the work of this division is carried on in such intimate relationship with other activities of the Council that the two could not be separated without serious loss of efficiency. It will suffice at this point, therefore, to speak in general terms of the successive steps in the development of our financial resources. At the outset the Council was fortunate enough to secure the cooperation and support of the engineering foundation, which offered its funds, supplemented by special gifts from Mr. Ambrose Swasey and Mr. Edward D. Adams, to assist in meeting the needs of the Research Council, and provided it with an office in New York, together with the services of its secretary. Subsequently, Mr. Cleveland H. Dodge and Mr. Martin A. Ryerson contributed toward the support of the Council, and special gifts to the chemistry, geology, and psychology committees did much to facilitate their work. The chief difficulties of the formative period were overcome, however, through a grant of \$50,000 to the National Research Council, made payable through the president of the Carnegie Institution of Washington. In physics, particularly, the action of the Chief Signal Officer provided the means of developing the large number of physical devices required for the use of the Signal Corps, and also of equal value for other branches of the service. The connection of the Council with the Army and Navy, through its military committee and also through the appointment of some of its members to military positions, has been of great value in establishing cross connections between bureaus interested in similar research problems, and in rendering available to both arms of the service devices developed through any special agency.

Thus the period marked by serious limitation of funds, felt in all phases of the Council's work, is giving place to a new period, in which

the work is progressing much more effectively. Like other bodies working during the first months of the war with the Council of National Defense, the Research Council provided its own funds and paid its own expenses. The nature of our work could not be expected to make a strong appeal until sufficient success had been attained to demonstrate its thoroughly practical value. Thus while special grants were made by both the War and Navy Departments to cover the expenses of various investigations organized by the Research Council, no general appropriation was obtained until January 7, 1918, when the President authorized a grant of \$29,250 from his special fund, through the Council of National Defense, for the rental of the building at 1023 Sixteenth Street, now occupied by the Research Council, and for other miscellaneous expenses. The second important appropriation received through the Council of National Defense was the sum of \$38,400.

A further grant of \$61,000 has been authorized from the special fund at the disposal of the President of the United States for war purposes to cover the general expenses of the Council and the expenses of the Research Information Committee for the half year ending December 31, 1918; the Rockefeller Foundation has appropriated \$50,000 for the expenses of the Division of Medicine and Related Sciences during the period of 10 months ending December 31, 1918, and the Carnegie Corporation of New York has given a sum of \$100,000 toward the expenses of the divisions of the Council for the year ending June 30, 1919.

These cases illustrate how the work of the National Research Council has gradually gained the recognition and support of the Government. But in many instances grants from private funds are not only desirable, but essential to success. In certain bureaus of the Government ample funds are available for research. In other bureaus little or nothing has been provided for such purposes. But even when research funds are available, they can not ordinarily be appropriated until some specific device reaches a stage where its further development is clearly advisable. Thus the expense of the international conference for the discussion of submarine problems, organized in June, 1917, were borne by the Research Council, and the necessary traveling expenses of several of the physicists who subsequently took part in the researches conducted in cooperation with the Navy were also met from our funds. As for the cost of these researches, this was borne in part by universities and other organizations, in part by the Research Council, and in part by the Navy Department, which has recently developed special laboratories and other facilities for this purpose, and provided large funds for its prosecution.

WAR ORGANIZATION.

As soon as the improved financial position of the Council permitted, a war organization of the Council, which appears on page 235, was undertaken, combining the work of its committees in various divisions, and concentrating its activities in Washington.

FUNCTIONS OF DIVISIONS.

It is impossible within the limits of this report to give a detailed account of the work of the various divisions and of the committees grouped under them. Reports of the meetings of the executive board of the Council have been published in the Proceedings of the National Academy of Sciences, where many of the committees have also published reports. In order to give an intelligent idea of the present status and activities of the Council, however, it will be necessary to speak briefly of the plan of organization and of the work of the various divisions.

The executive board of the war organization takes the place of the former executive committee of the Council. It is constituted of the chairmen and vice chairmen of the various divisions, the chairmen of the sections of the Division of General Relations, together with several members at large. The executive board meets monthly and transacts the general business of the Council. In order to secure prompt action when needed, however, a smaller committee has been authorized to act when necessary, subject to the approval of the executive board.

DIVISION OF GENERAL RELATIONS.

One of the most striking consequences of the war is the increasing general realization of the primary importance of scientific research to the whole question of national defense, as well as to the successful prosecution of industry and the greatest measure of economy of resources after the war. The necessity of research work as the only means of solving many military and industrial problems raised by the war was realized by the British, who, despite the stress of war, have adopted a comprehensive scheme, under the supervision of a special committee of the privy council, to which Parliament has voted a sum of one million sterling. This fact in itself shows the importance which the British attach to the organization and prosecution of industrial research; and action in the same general direction has already been taken by France, Australia, Canada, and New Zealand, not to mention Germany, which has long been awake to this need. Impressed by the paramount importance of promoting the application of science to industry in this country, the National Research Council has taken up the question of the organization of industrial

research. It believes that this matter should be furthered in every way possible and as rapidly as may be for the following reasons: In the first place, because of the necessity for rapid technical advance in many industries, if we are to compete successfully with other nations, both now and after the war; secondly, because any steps taken in this direction will react immediately to further the general appreciation of science and of its usefulness when applied; thirdly, because the present time is conducive to the growth of new ideas—indeed, such a favorable opportunity may not recur.

The National Research Council has inaugurated accordingly an industrial research section, which shall consider the best methods of achieving such organization of research within an industry, or group of related industries (e. g., industries using the same raw materials or with similar waste products). It considers that cooperation between capital, labor, science, and management constitutes the best general means of financing and directing the extended laboratory investigations and the large scale experimental and developmental work required for adequate industrial research. In pursuance of this general plan it is forming an advisory committee, composed of strong men with the imagination to foresee the general benefits which would certainly follow from the further progress of science and from a more general and more thorough application of science to industry.

The present membership of the advisory committee is as follows:

Theodore N. Vall, chairman.	Pierre S. du Pont.
Cleveland H. Dodge.	H. S. Pritchett.
George Eastman.	Edwin Wilbur Rice, jr.
E. H. Gary.	Elihu Root.
A. W. Mellon.	Ambrose Swasey.

The active work of the section will be in the hands of the following group:

John Johnston, chairman.
L. H. Baekeland, of the Naval Consulting Board.
A. D. Flinn, Secretary of the Engineering Foundation.
C. E. K. Mees, research laboratory of the Eastman Kodak Co.
Walter Rautenstrauch, of Columbia University.
Allen Rogers, Chemical Service Section of General Staff.
W. R. Whitney, research laboratory of the General Electric Co.
A representative of the Bureau of Mines to be designated.
A representative of the Bureau of Standards to be designated.

The first work is to be the publication of a series of bulletins designed for purposes of propaganda. It is intended that the first of these shall contain statements regarding the national importance of scientific and industrial research by the several members of the advisory committee, together with a general introductory statement prepared by Dr. Hale. Succeeding bulletins will contain readable

accounts of the work of some of the large industrial research laboratories now in operation; Col. Carty has already agreed to prepare one on the research work which has been carried out by the American Telephone and Telegraph Co., and others are being arranged for. It is also proposed to carry on propaganda work in the technical press and the Research Council has already been assured of cooperation in this matter on the part of certain technical publications.

In addition to this propaganda work, it is proposed to bring up the whole question of industrial research at meetings of various technical societies, and also formulate definite plans for specific projects of research, and to secure the support of the manufacturers specifically interested.

This is certain to prove one of the most valuable branches of the Council's work, as it will be called upon to assist in securing the widest possible appreciation of the necessity of introducing scientific research on a large scale into the industries. The British advisory council for scientific and industrial research has been especially active in this field, and has already secured results which will greatly strengthen some of the larger industries of the British Empire.

At the request of the Commissioner of Patents, and with the approval of the Secretary of the Interior, the National Research Council has organized a committee to investigate and report upon the work of the Patent Office in the hope of finding means of improving the present procedure. The work of this committee will be done in connection with the other activities of the division of general relations.

The activities of research committees in educational institutions and of State research committees constitute an important phase of research in this country. A section of the division of general relations has aimed to assist in making possible full cooperation of these committees with the Research Council and with research agencies of the Government.

STATE RESEARCH COMMITTEES.

The following report of the chairman of this section expresses the attitude of the Research Council toward the work of State research committees:

It is the opinion of your committee that the greater part of the problem work of the National Research Council can be handled most satisfactorily through the special committees or divisions established for research in specific fields of investigation. To a limited extent phases of these investigations of problems may be turned over to adequately organized and supported research groups in different parts of the country, some of these groups representing educational or research institutions and others being organized under the auspices of State governments or State councils of defense.

As numerous important problems of research relate to the development of natural resources, industries, consideration of health conditions, and other problems of a local nature, it seems desirable in many cases to have an organization of research interests related to the State and, if possible, supported by it. Such organizations might, under existing conditions, be best cared for as committees under the State councils of defense.

It is desirable to have the National Research Council so related to the State research scientific committees that the results of their investigations may become quickly available to the central office of the Council and that the needs of the council for work of a local character may be met by the State committees.

Your committee respectfully suggests the following definition of function, organization, and relations of State research committees:

Function of State research committees: Problems involving local needs in development of natural resources, local industries, health conditions, or any matters to which science may lend its aid.

Problems involving local materials, industries, laboratories, or talent, development or use of which would contribute to the good of the Nation as a whole or in part, regardless of questions of needs of the State in which the investigation originates.

Organization of State committees: In initial organization the State committee should be small but widely representative of fields of research. Additions to membership should be made as the development of actual research progresses. The committees should, at the outset, include members of State boards covering work in which scientific research plays an important part and representatives of scientific organizations or institutions at which significant researches are in progress, especially institutions in which research committees are organized.

State research committees should at this time be organized as subdivisions of State councils of defense, where such councils exist.

Financial support of State committees should come from State funds received by way of the State councils of defense, or from other special funds. It is in all cases desirable to have secretarial organization permitting full correspondence on all matters relating to the committee.

Relation of Research Council to State committees: It is desirable to have the State research committees affiliated with the National Research Council; the results of work of these committees should be reported to the State council of defense and to the National Research Council by way of either or both of these bodies; results obtained by the State research committees should go to the Council of National Defense when needed.

Several of the State committees organized under the State councils of defense have performed important service in bringing about full coordination of the research agencies of the States, and making possible a considerable measure of success in various fields of investigation by furnishing financial support from the State. Organization of some of the most successful State committees has included representatives of State boards related to scientific work and with these a number of the eminent investigators connected with the work of educational and research institutions.

RESEARCH COMMITTEES IN EDUCATIONAL INSTITUTIONS.

Research activities of nearly all the educational institutions have undergone very considerable modification since the beginning of the war and have been given over almost entirely to work upon emergency problems. In some universities the research committee has come to be known as a war research board and has a very carefully planned program of work related to the research agencies in Washington. Such investigations have made valuable contributions. This work has served the further important purpose of permitting the continuation of necessary university instruction by men of eminence in science, who are at the same time doing service to the Government in their special fields.

The committee has endeavored to keep in touch with the activities of all research committees, and a program for placing special problems with these committees is now in operation.

MILITARY DIVISION.

The former military committee of the National Research Council was one of the first committees to be organized and had for its chief factor the securing of necessary cooperation with the Army and Navy in the solution of problems requiring research investigation. This committee in the new war organization becomes the military division of the Council. The most valuable result of the cooperation referred to is the organization of the Research Information Committee, with offices in Washington, London, and Paris, with the definite function of disseminating information relating to war problems between the allies in Europe and the United States. With the authority and assistance of the military division arrangements have been made for regular weekly conferences of the divisions of physics and engineering, in which leading representatives of the Army and Navy participate.

DIVISION OF ENGINEERING.

The chief normal work of this division during the war is to make researches which promise to help the governmental Departments in war matters. Many of these researches consist in developing ideas, often initially nebulous, far enough to show their value and thus the importance of completing their development. Others aim to effect important economies or advance in industry and still others to find the appropriate process or product for some governmental need. However complete the technical organization of any bureau, its working capacity is limited, whereas the demand for results is unlimited as to both time and quantity.

Eight of the great engineering societies are officially represented on the divisional advisory committee for their support in manning the division, in bringing important problems to it, and in guiding its general efforts. For like reasons and also that the division's cooperation may the more readily be sought and given several of the military and other governmental bureaus also are represented on its sectional committees.

Among the subjects which the division is now studying actively are many novel kinds of cannon; tanks of various types; methods of bettering the aim of naval guns; aircraft engines; helmets and body armor; the electric welding of ships; and the economy of manganese, both through improvements in smelting its ores and through replacing it in large part by other deoxidizing agents in steel making. Any such economy would release for direct war service vessels now used for importing manganese ores.

Though subjects of direct military value receive the first attention, as time permits other subjects of economic importance will be studied, such as the fatigue strength of metals.

DIVISION OF PHYSICS, MATHEMATICS, ASTRONOMY, AND GEOPHYSICS.

ORGANIZATION.

The activities of the division center about the work of (1) the executive committee of the division, (2) the research information committee, and (3) the joint conference of the physics and engineering divisions.

(1) The executive committee meets weekly for discussing the status of researches within its field, for initiating new researches, and for recommending personnel for these researches.

(2) All of the reports on physics and engineering which are sent in from abroad are read by a small group chosen from the executive committees of the physics and engineering divisions and are distributed to the suitably authorized agencies through this group.

(3) The joint conference of the physics and engineering divisions is held under the authority of the military division of the National Research Council, and is attended by some forty of the most prominent representatives of physics and engineering in the War and Navy Departments, and in civil life. At this conference brief reports on all of the information which has come in during the week from the scientific attachés in Paris, London, and Rome is presented, and some scientific or technical subject connected with the developments of the war is discussed by competent representatives of the English, French, Italian, or American services.

RESEARCH ACTIVITIES.

The work of the physics and engineering divisions is organized about the problems actually under investigation by these divisions, the committees of the two divisions being in the majority of cases problem committees rather than subject committees. Most of the problems are being attacked by a group containing both physicists and engineers. There are at present 90 problems under actual investigation by these two divisions. Of these, 13 are under the general head of aeroplane instruments, 8 are in photography, 12 in signaling, 14 are detection problems, 13 are general aeroplane problems, 6 are balloon problems, 18 ordnance problems, and 6 are miscellaneous.

The military situation makes it undesirable to report the complete list of these problems with the names of the men who are working upon them. These latter constitute the greater bulk of the committees of the physics and engineering divisions of the National Research Council. There have already been a number of results of far-reaching importance, some of which may be mentioned:

1. A nonleakable gasoline tank for aviators has been developed by Dr. G. S. Fulcher, through which as many as 15 incendiary bullets have been shot at 2,700 foot-seconds without producing any gasoline leak whatever. Planes are being equipped with these tanks as rapidly as possible.

2. Five new types of signaling lamps have been devised and tried out on the Western Front and very favorably reported upon. This is an important contribution to the work of the Signal Corps.

3. Filters and color screens for increasing visibility have been developed by Drs. Ives and Priest and adopted by naval and military authorities.

4. An elaborate investigation on the relative merits of monoculars and binoculars has been made by a committee of the physics division, of which Dr. Hyde of the Nela Research Laboratory is the chairman. As a result of this work monoculars have been recommended to the General Staff in place of binoculars for certain classes of service. If this recommendation is adopted, there will result a large saving of time and expense in the production of optical instruments, and an increase in convenience to troops because of the reduction in weight.

5. The sound ranging work in the Army was originally organized through the activity of the physics committee of the National Research Council, and important contributions to the methods in use in the foreign service have been made by the group working upon it in this country, Dr. Russell, of Princeton, having developed the shortest method now known for computing sound-ranging data.

6. Dr. Russell and a group of engineers of the Western Electric Company have developed a new method of locating aircraft by sound which is of much promise.

7. A number of groups of physicists have been formed through the physics committee for work under the special board of the Navy on submarine detection and results of the utmost importance have been obtained by these groups.

8. Charts of the highways of the upper air are being developed in aid of aviation through a group organized by the physics committee of the National Research Council.

9. Electrostatic dangers to balloons have been studied and methods of avoiding them devised.

10. A new method of determining the initial speed of projectiles has been devised largely through the work of Dr. Klopsteg and has been put into use by the Ordnance Department.

11. The new optical range finder, upon which Prof. Michelson has worked for the past year, has been approved by the Navy and a certain number of them ordered to production.

12. Through the activities of the committee on optical glass the production of optical glass has been increased from almost nothing at the beginning of the war to an amount adequate to supply America's needs and to leave some over for foreign use if desired.

These are but samples of the results already accomplished. Some of the developments which are under way promise even greater importance than any of the dozen developments noted above, any one of which, however, would have more than justified the expenditures involved in bringing them all about.

DIVISION OF MEDICINE AND RELATED SCIENCES.

The character of the division may be outlined as follows:

Purpose. To concentrate in Washington a comparatively small body of men representing the existing committees and thus provide for effective cooperation in the rapid organization of medical research as an aid to the solution of urgent military problems.

Field. Medicine, surgery, hygiene, physiology, anatomy, psychology, psychiatry, physical anthropology, and closely related subjects.

Methods. 1. To cooperate closely with the Surgeon General of the Army (through Col. Russell) and of the Navy (through Dr. Stitt) in determining urgent problems, and to enlist the aid of civilian laboratories in the solution of these problems.

2. To assist the Surgeon Generals of the Army and Navy in procuring trained investigators to enter the respective services as contract surgeons to undertake special field investigations during short periods of time.

3. To send, if it is considered advisable, individuals to England, France, and Italy to determine the urgent problems which should be taken up without loss of time in civilian laboratories in this country.

4. To invite, if it is considered necessary, commissions or individuals from England, France, and Italy to this country to advise with the medical division of the National Research Council.

5. To maintain correspondence with prominent medical investigators in the American Expeditionary Forces and in civilian laboratories in France, England, and Italy, and thus obtain reports of the important fields of research, the character of the work in progress, and the needs of the workers.

6. To establish relations with and, if agreeable to them, to cooperate with research organizations abroad, as (a) British Medical Research Committee, (b) the research society recently organized in France by medical officers of the American, French, and British forces, and (c) the Committee on Medical Research of the American Red Cross in France, etc.

7. To obtain reports of all medical research organizations in this country dealing with war problems and of individuals engaged in the investigation of war problems.

8. To maintain a bureau for the dissemination of up-to-date bibliographies of all forms of medical research bearing on war problems.

9. (a) Prepare lists of individuals and laboratories equipped and ready to undertake research at short notice.

(b) Prepare lists of individuals who will hold themselves in readiness to move from laboratory to laboratory to work for shorter or longer periods on special or emergency problems or to augment existing laboratory staffs in a group of selected laboratories.

10. To hold conferences from time to time in Washington or other central city for discussion of important research problems and methods of attack.

11. To hold military medical meetings from time to time in the neighborhood of large cantonments for the discussion of medical problems by military and civilian physicians.

DIVISION OF CHEMISTRY AND CHEMICAL TECHNOLOGY.

The chemical work of the council has been reorganized and is now in the hands of a division of chemistry and chemical technology, the purpose of which is to secure effective cooperation in the investigation and solution of the many pressing problems involving chemistry and chemical engineering which have been raised by the war. These problems are so multifarious that they can not be readily summarized or tabulated, but the following general statement may serve to illustrate the work of the division. Its chief purposes are:

1. To ascertain the most urgent problems arising out of the various war activities of the Government and to place these problems before men qualified to solve them.

2. To enlist the support of the chemists and chemical technologists and to keep as fully informed as possible about their training and qualifications, so as to aid the Government in the selection of competent men in chemical work here or abroad.

3. To aid in the interchange of information with our allies; to keep in touch with all chemical research work now going on in this country, and to keep informed upon the chemical equipment available at the various institutions and industrial plants where such work could be carried on.

4. To cooperate with manufacturers in an endeavor to utilize waste and by-products, to devise acceptable substitutes for raw materials which are scarce or urgently needed for other purposes, to promote the manufacture of wholly new substances (for example, for gas warfare), and to insure that the equipment in men and material may be used to the best advantage.

5. To point out the advisability of having new and up-to-date advanced textbooks and reference works in chemistry in English, and to work toward securing a better appreciation and a more intelligent support of chemistry on the part of the community.

6. To hold conferences in Washington or elsewhere for the discussion of important research problems, or of ways and means of making the work of the division more effective.

DIVISION OF GEOLOGY AND GEOGRAPHY.

The work of the division of geology and geography as organized on a war basis is directed by an executive committee, including representatives of a number of the principal organizations in geology and geography, related to emergency work. The members of the division committee are either resident in Washington or so situated that they are able to be in attendance at meetings of the committee. The regular meetings of the committee are held on Friday of each week at 11 o'clock.

The work of the division has covered:

1. Assembling of information regarding geologists and geographers prepared for emergency research, and also covering investigations in research work in geology and geography in educational institutions, research institutions, and departments of the Government.

2. Promoting the coordination of research through bringing organizations and individuals into relation to emergency investigations.

3. Cooperation with agencies of the Government in response to requests for information or assistance.

4. Initiation of work on new problems arising out of the present crisis and the relation of such new research to established governmental agencies.

5. The study of problems of instruction in geology and geography through their numerous phases from work in colleges and universities to the possible contribution of these sciences to military training.

6. Study of possible contributions of geology and geography to interpretation of problems encountered in warfare.

DIVISION OF AGRICULTURE, BOTANY, FORESTRY, ZOOLOGY, AND FISHERIES.

The division of agriculture, botany, forestry, zoology, and fisheries is now well organized. It is composed of four constituent committees representing agriculture, botany, botanical raw products, and zoology, and representatives of forestry and fisheries. In addition it includes certain special committees which have been appointed to consider special large problems. Some of these are joint committees composed of representatives not only of the division of agriculture, botany, forestry, zoology, and fisheries, but of representatives of other divisions, as chemistry, geology, engineering, etc.

The division has effected a certain affiliation with the war emergency board of plant pathologists and is taking an active interest and giving material support to the work of crop protection being carried on by this board.

The efforts of the division are directed toward effecting the co-operation among workers in the various subjects indicated by its title, as well as toward the carrying on of certain projects under the direct charge of various members of its constituent committees.

The division is giving active attention to the matter of preventing a too serious drawing away of trained men and experts now engaged in the important practical work of preserving and expanding food resources of the Nation. It is also interested in preserving opportunities for the continued instruction and training of young men in order to maintain the national food resources after the close of the war. It is cooperating with various governmental organizations interested commonly with it in those lines of pure and applied science indicated by the title of the division.

FUTURE OF THE NATIONAL RESEARCH COUNCIL.

The results already accomplished by the National Research Council and the increasing requests for its assistance seem to leave no doubt as to the need for a centralizing body of this character. A plan of permanent organization, adapted for the conditions existing after the war, is being carefully studied. The organization of the Research Council under the charter of the National Academy of Sciences, the

recognition of its work, and the issuing of an Executive Order by the President of the United States, provide the necessary connection with the Government and eliminate all political influences from the appointment of its members. The inclusion of the heads of Government bureaus devoting special attention to research and the plan of securing their appointment by the President on the nomination of the National Academy provides for the first time a means of effecting necessary cooperation between these bureaus, which have developed to great proportions and have at their disposal large sums for scientific research. Other elements in the permanent scheme of organization must be such as to assure the close cooperation of all research agencies in the country and of the chief national scientific, technical, and engineering societies interested in research. The widespread cooperation already secured and the experience gained in connection with the war will afford a useful guide for the development of a sound and effective plan.

**STATEMENT OF CONTRIBUTIONS AND APPROPRIATIONS FOR THE WORK OF
THE NATIONAL RESEARCH COUNCIL.**

(From Sept. 1, 1916, to June 30, 1918 (22 months).)

I. Cash donated to the council on account of general expenses of office, maintenance, and special investigations:

Engineering foundation—		
Services of secretary	\$5,000.00	
Expenses of committees	510.00	
Office and traveling expenses	3,526.09	
		\$9,036.09
George S. Isham		50.00
Martin A. Ryerson		1,000.00
Anonymous		100.00
Cleveland H. Dodge		5,000.00
Clarence H. Mackay, for expenses connected with work of subcommittee on protective body armor		1,000.00
Carnegie Corporation of New York		50,000.00
Rockefeller Foundation, for division of medicine		50,000.00
Special contributions for work of psychology committee		4,100.00
Special contributions for work of chemistry committee		4,614.05
Special contributions for work of geology committee		850.00
		74,750.14

II. Governmental appropriations available for work under immediate direction of Research Council:

President's emergency appropriation (available through the Council of National Defense), general office expenses of Research Council		29,250.00
Council of National Defense—		
Appropriation for agriculture committee	\$3,000.00	
Appropriation for research information committee	38,400.00	
		41,400.00
War Department, Ordnance Bureau, special appropriation for development of new type of gun by Research Council		15,000.00
		160,400.14

III. Governmental appropriation for work organized in connection with the National Research Council (estimated):

United States Signal Corps, for work of science and research

division—

Personnel..... \$45, 000. 00

Equipment and supplies..... 65, 000. 00

\$110, 000. 00

270, 400. 14

Many other appropriations have been made by Government bureaus, educational institutions, and private research laboratories for investigations which have been conducted more or less directly in cooperation with the Research Council. The total amount of such contributions for research work can not be closely estimated.

INVENTIONS.

(Naval Consulting Board of the United States.)

The Naval Consulting Board of the United States, headed by Thomas A. Edison, and composed of eminent scientists and inventors, acts as a board of inventions for the Council of National Defense, under the following resolution adopted by the Council on February 15, 1917:

Whereas the Naval Consulting Board has informed the Secretary of the Navy that it holds itself at the service of the Department of War or the Council of National Defense to act as a board of inventions or in any other capacity which may be of use to the Government in the present emergency:

Be it resolved, That the Council of National Defense hereby express its appreciation of this action on the part of the Naval Consulting Board:

And be it further resolved, That the Council call upon the board for advice and assistance whenever the occasion therefor shall arise.

The board is now, and has been for over a year, actively engaged in the investigations of plans and operations to counteract the submarine menace; it has stimulated interest in war problems, and has stirred a patriotic spirit and effort among inventors. More than 65,000 suggestions and plans have been considered and acted upon.

HIGHWAYS TRANSPORT COMMITTEE.

Recognizing the national value of the use of our highways in relation to, and properly coordinated with, other existing transportation mediums, and more particularly the necessity for the immediate development of such use to the end that the highways might carry their share of the war burdens, the Highways Transport Committee was appointed by the Council of National Defense in November, 1917. The object of the committee was to increase and render more effective all transportation over the highways as one of the means of strengthening the Nation's transportation system and relieving the railroads of part of the heavy freight-traffic burden.

The more important policies enunciated to date are:

Assisting the War Department in the operation of its motor-truck convoy service to save freight cars and give proper training to Army truck drivers, as well as to expedite the delivery of the trucks themselves.

Encouraging States in the snow zones to remove snow from the main highways and keep them open for highway traffic during the winter season.

Assisting the Railroad Administration to reduce terminal congestion by developing "store-door delivery" to relieve promptly terminals of freight as it is received.

Increasing highways transport resources and avoiding waste by eliminating empty running of vehicles. "Return-load bureaus" are established for this purpose.

Making more food available to the cities and saving farm labor for work on the farm by developing rural motor express routes from agricultural areas to consuming centers or shipping points.

Making highway transportation more efficient by encouraging the use of better methods of transport and more effective vehicles, with resulting saving of man power and increased transport capacity.

Organizing the highways transport facilities of the country by the appointment of State highways transport committees under the State councils of defense with the duty of developing these policies in each State.

Plans of national scope were formulated and activity on the many important duties ahead was begun immediately. Contacts were formed with the different Government departments, State councils of defense, organizations interested in this work, etc.

ARMY CONVOY WORK.

At the request of the Quartermaster Department of the Army, the committee laid out routes over the highways from inland points of manufacture for thousands of Army trucks. A pathfinding car, in charge of a representative of the Highways Transport Committee, an officer from the War Department, and the State highway engineer of each State as it was traversed, accompanied the car. The pathfinding car started from Detroit, Mich., to lay out the first route of this kind ever known in the history of the United States.

Many difficulties were met, snow hindered progress, and inclement weather attended part of the trip. All potential routes in each State were traveled, until finally the one was located and decided upon which would best fit in with the whole route when completed. Immediately upon the completion of the charting several hundred copies of the log of the route were made. Each truck convoy starting over the highways for delivery at the seaboard was supplied with copies

of the log, which were of the greatest assistance in facilitating delivery and guiding the trucks over the best roads until the route became a familiar one and the logs of the trip were no longer needed.

A second important route was laid out shortly after, running from Buffalo, N. Y., to the seacoast through New York State via Albany. Another route was mapped out from Wisconsin, Illinois, and Indiana to the seaboard. Feeder lines connecting up the points of manufacture with the main routes to the East have been added, until a network of routes is now completed, over which thousands of our Army trucks have been delivered and many thousands more will be delivered.

The advantages secured by this movement over the highways have been twofold: First, the valuable training which is received by the enlisted men in the handling of these military trucks, thus preparing them so that a minimum of training is required on the other side; and, second, the greatly expedited delivery of the trucks themselves, with the resulting saving in freight cars.

ROUTING AND MAPPING.

In addition to the information furnished the Quartermaster Corps in moving Army truck convoys to the ports of embarkation, much assistance has been rendered other departments of the Government as well as different associations and individuals who have requested data of this sort. Considerable mapping has been done in connection with the committee's activities along other lines, as, for instance, in the development of rural motor express, where charts have been made of the lines in operation, and the need for other lines in new territories visualized.

SNOW REMOVAL.

Much difficulty was encountered at the beginning of the movement of Army truck convoys by snow blocking the highways and impeding progress. Many roads were almost impassable and convoys were held up for hours until a way could be cleared. Some trucks were disabled or stalled in the snow and could not be removed under their own power. However, through the efforts of the Highways Transport Committee, excellent cooperation was secured from practically all the States through which these convoy routes passed, and the highways were cleared of snow and kept open. Uninterrupted delivery of Army trucks followed in a steadily increasing stream.

Intercity motor highways transport was practically impossible in the snow zone, except over the Army truck routes. Further efforts were directed by the committee in urging that all main traveled highways be kept open during the winter to assist the railroads by allow-

ing intercity highways transport of short-haul freight in the congested area to continue during the winter as well as in summer. Due to difficulties, or lack of adequate provision in State laws for the removal of the snow, small results were obtained in this direction, but it is hoped great progress will be made by next winter.

STORE-DOOR DELIVERY.

Coincident with action looking toward the increase in, and more effective use of, all highways transport, much study was given to the problem of terminal-congestion relief on the railroads, and a plan of store-door delivery evolved whereby the consignee is not permitted to send for his goods at the freight station or pier, but they are delivered to him immediately upon their arrival, and individual trucks operate in a pool for the benefit of all.

Several conferences were held on this proposition between the chairman of the committee and authorities who had the problem under consideration. At the request of the Director General of Railroads, James S. Harlan, of the Interstate Commerce Commission, made an investigation of terminal conditions in New York City. Commissioner Harlan's report and suggestion for relief embodied most of the major points in the Highways Transport Committee's plan for store-door delivery. This report was approved by the Railroad Administration, and Commissioner Harlan given the authority to proceed with the institution of this terminal relief in New York City, which will begin shortly.

RETURN-LOADS BUREAUS.

Realizing the inefficiency of any vehicle carrying a load only one way, return-loads bureaus have now been established in many cities to help eliminate this waste in transportation and thus increase present highways transport facilities.

These bureaus were organized somewhat after the English plan, where the waste occurring by "light running," as they call it, was early recognized and steps taken to prevent it. With the cooperation of the Highways Transport Committee, a large number of these bureaus have been put into operation in the various States and are now working efficiently in securing loads, when available, for return trips of motor vehicles.

These bureaus are usually located in the office of the local chamber of commerce, and fine cooperation has been received from them and similar organizations in getting this movement under way and carrying it on.

Satisfactory results have been accomplished in making available more transport facilities over the highways by this method, and some 35 bureaus have been established, with more being placed in operation rapidly.

RURAL MOTOR EXPRESS.

In line with the Food Administration's desire to have as much perishable food as possible consumed at home, thus conserving concentrated foods for shipment overseas, rural motor express has met with great encouragement and cooperation in its development. It has as its primary object the making available of more food by furnishing the farmer with regular and dependable transportation for getting his produce to market. Rural motor express supplies that long-felt want of the farmer—universal rural transportation—and aims to make every farmer's gate a shipping platform.

Early in the year surveys were made of the then existing lines in operation around the cities of Washington and Baltimore, where many tons of food were daily being carried into these population centers for local consumption, thus opening up a market for the farmers of the surrounding rural sections, who were enabled to profitably raise large amounts of food which there had previously been no means of marketing.

Following the plan of the operation of the lines in Maryland, efforts were begun to secure the nation-wide operation of rural motor express. The best of cooperation is being given by the United States Food Administration and its entire organization throughout the various States, the Department of Agriculture, the Department of Labor, and various associations of the country, prominent among which is the National Automobile Chamber of Commerce.

Rural motor express is now becoming recognized everywhere as a determining factor in the winning of the food war, and nearly every day brings notice of new lines started or further progress made. The results secured might be classed under two heads in order of their importance: First, the increase in the food supply which is effected and, second, the conservation of farm labor through allowing the farmer to remain on the farm at work.

HIGHWAYS TRANSPORT CONFERENCE.

Foreseeing the great development to come in highways transport and the need for organized effort in handling and directing this development, a conference was held at the offices of the Highways Transport Committee on June 4 and 5. Representatives were present from a large number of States, coming from State councils of defense, State highways transport committees, and many others keenly interested in highways transport. Various policies and plans for action were discussed. Advice and suggestions were given along lines of how cooperation in each representative's respective territory could be made most valuable.

WORKING ORGANIZATION.

In order to provide a point of contact with each State and to secure more vigorous execution of plans and policies, State highways transport committees have been appointed in many States under the State councils of defense. This plan is not completed yet, but is proceeding rapidly, and when finished each State committee will be in shape to go ahead and divide its territory into districts, appointing a highways transport committee in each district, thus perfecting a forceful working organization for the vigorous execution of the important work of increasing highways transport and rendering it of the greatest possible benefit in coordination with all other forms of transportation.

THE CHAMBER OF COMMERCE OF THE UNITED STATES AND WAR SERVICE COMMITTEES.

The Council has continued to avail itself of the facilities for coordination of industrial resources which are afforded by the Chamber of Commerce of the United States. The Chamber's activities have followed the principles which the organizations in its membership adopted in the spring of 1916, when they formally committed themselves to advocacy of a Council of National Defense for the coordination of the Nation's economic resources. Since the Council was authorized and established the Chamber has assisted in economic coordination in ways for which it is peculiarly fitted as a federation of trade and commercial organizations, and which had already proved valuable to other departments, as for the Navy in developing new sources of supply for the articles it needs.

In September, 1917, this assistance began to take a form which has now reached very considerable development. In order that Government officials might deal with any industry with full knowledge of the state of the industry the Chamber then urged every industry to select a representative war service committee which could at all times be available for conference and would be equipped with complete information regarding its field. Obviously, such committees are essential if the Government is to act justly toward all units which are in a similar situation, and regardless of the question that has to be solved. The question may be of transformation of equipment for special products, of production for the Government's needs, of the requirements of the industry for material, fuel, labor, or transportation, or of the curtailments which should be made in view of the national necessities in other directions. Such committees can also have a very important place in the fixing of prices, which has become a well-developed governmental function under the Council and the War Industries Board. In this connection

it should be borne in mind that in the summer of 1917 the Chamber formally committed itself to the creation of means for controlling prices and advocated cooperation and advice from committees for the industries affected—a function which war-service committees are prepared to perform.

WIDE REPRESENTATION.

For success the committees must, of course, be truly representative. This means the representation must be as diverse geographically as the industry and that enterprises outside the existing trade associations must be included as well as those in the associations. In other words, these committees have to be created through genuine democratic processes and according to real democratic principles. At the same time, they are completely autonomous, being independent of official suggestion or interposition.

This form of industrial organization was determined upon by the Council in November. The creation of war-service committees as any official agency has occasion to consider the equipment or situation of an industry is now under the supervision of the Chamber's war committee, of which the Chamber's president is chairman, and which always has on duty at Washington several of its members. Notice from any official agency that conferences are desired with representatives of an industry sets the machinery of the Chamber's committee into action, all elements of the industry, no matter how antagonistic among themselves in normal times, are brought together, and the members of the industry themselves select a war-service committee which they consider in fact representative. The Chamber's war committee then certifies to governmental authorities that a committee has been formed in this manner and is ready to enter into conference.

By December, 1917, the significance and usefulness of war-service committees had become so apparent that the chairmen of those which had then been created were assembled in convention at Washington. At this meeting the principles and procedure were discussed and a common understanding of the purposes in view was promoted.

Experience has indicated some minor changes in form. For example, the Chamber's war committee has now constituted in its membership a war-service executive committee. There have been no departures from the fundamental principles, however. As the influence of war conditions has spread, war-service committees have been increased, industry by industry. In the spring, at the time of the separation of the War Industries Board from the Council, there were about 200 war-service committees. They could speak for industries as diverse as the manufacture of toys and the refining of petroleum. Both before and after this separation the War Industries Board and

its subsidiary divisions had been the principal Government agencies utilizing the committees, but other parts of the war organization, such as the Fuel Administration and the War Trade Board, may have need for their services. For all these agencies the committees are always ready with technical information and advice, and at the same time they serve as channels for communication of official decisions to all the industrial enterprises which are most directly interested. At the same time the Chamber's war-service executive committee sends information of more general application to all the Chamber's members.

In these ways the Chamber has performed functions of economic and industrial organization, and the results will be valuable not only during the war but for the period of transition which will begin when hostilities cease.

COMMITTEE ON ENGINEERING AND EDUCATION.

The first few months of the fiscal year just ended, like those immediately preceding, were largely concerned, first, with bringing to Washington men who could advise authoritatively on the branches on which they had special knowledge; and second, with the meeting of the many new problems which war preparation and prosecution created. This period was devoted to forming such organizations as could carry on the executive work arising from the many new problems, giving advice to such organizations of the Government as already existed and were rapidly expanding, and lastly, with the turning over of organized knowledge and of organized committees to the Government.

The latter part of the period has been almost wholly concerned with the continual solution of industrial problems connected with the war by the aid of engineering and education. It has been almost entirely devoted to work corresponding to that of a consulting engineer, in response to calls by various departments and bodies in Washington for consultation on problems concerned with the manifold adjustments which were necessary to bring about a speeding up of production and industrial activities for the winning of the war.

ENGINEERING.

In the late fall of 1918 the engineering sections which had been organized for carrying on the work of the committee had been practically turned over to the Government, the work undertaken by them along organization lines had been finished, and all questions and problems presented for which the means of solution existed were answered, the only exceptions being with regard to problems of

absolutely current business, on which reports had been made up to the preceding month.

The principal activities of the committee may be briefly summed up under the following headings:

"Standardization of a type industry (the cotton industry) to meet war needs by a change from peace to war conditions, standardization of the lighting of munition plants and docks, and the development of sources of Army and Navy supplies, and of methods of meeting their needs."

Many of the problems presented were confidential and are therefore not yet available for public report. This whole period tended constantly toward a very much simpler and clearer expression of engineering facts and the development of short methods for use in the engineering fields of industry.

EDUCATION.

In the educational field certain specific work done may be noted, such as—

(a) The development of the educational policy of higher educational institutions, particularly the engineering institutions of the country, as a basis of the Army training schools. The work of this committee was afterwards turned over to the Committee on Education and Special Training of the War Department, and the recommendations made comprised a large part of the education work planned and now carried out in the S. A. T. C. of the Army.

(b) A complete survey and study of needs for dietitians and statistical secretaries resulted in complete and specific courses for any school which desires to be connected with the Government.

(c) Short courses in war industrial activities were planned and model courses established.

(d) The development of the liaison of the leading colleges and universities in the United States and Great Britain was brought materially forward. The visit of a Canadian University group gave the first impulse toward the learning by the United States of the lessons of the British universities during the war.

In the preceding paragraphs only brief mention has been made of what has been done, but certain lessons which have been learned may be stated very briefly.

It has been increasingly evident that the work of construction for war and reconstruction for peace must depend to a great degree on intelligent thinking along the lines of education and engineering. Success in the service of the industries to the Government, it is becoming more apparent, depends on those men, and only on those, who are willing to study and analyze their jobs and through such study make a real determination not only of the necessity of the present

moment, but also what the future need will be. An intelligent determination, the basis of which is arrived at through complete investigation based on definite knowledge and applied with technique and skill and with a balanced judgment in organization, is essential to such continued progress of the Nation as may make available for the use and service of the country the lessons of the war.

COMMITTEE ON LABOR.

The president of the American Federation of Labor, Samuel Gompers, as chairman of the Committee on Labor of the Council of National Defense, has continued the development of the work of that committee along the lines indicated by the first annual report of the Council, which told of its inception, outline of work, form of organization, and several achievements. Notable among the latter were the initiating and drafting of the war-risk insurance bill, providing various compensations for soldiers and sailors and their dependents; the publication of a statement defining labor's position in the war; the visit of British labor delegates to America; and the adoption of a declaration to the effect that economic and legislative standards should not be lowered unless the Council of National Defense should indicate that such a departure is essential for the national defense.

The soldiers' and sailors' compensation measure, turned over to the Treasury Department for administration, became operative October 6, 1917. Thousands of men have taken insurance under its provisions which they will be able to retain after the war at an extremely low rate. Thousands of their families have received the allowances and allotments of pay to which they are entitled under this measure; also, those who have been injured are receiving compensation during the period of incapacitation, and already there have been casualties bringing into play the section of the law permitting the just care of the dependents by the Government.

In January, 1918, the Council of National Defense authorized the Committee on Labor to promote its advisory work directly through the United States Department of Labor, securing its authorization for new activities from the Secretary, Hon. William B. Wilson, who is also a member of the Council of National Defense.

Cooperation with the Food Administration has been one of the large endeavors of the Committee on Labor, J. W. Sullivan, assistant to the chairman of the Committee on Labor, being also head of the Division on Labor of the Food Administration. Mr. Sullivan and W. N. Doak, vice president, Brotherhood of Railroad Trainmen, were members of the Committee on Fixing the Price of Wheat for the Crop of 1917. Mr. Sullivan has served also on the Food Administration's Committee on Milk and on Meat, and he has served as

chairman of a subcommittee on bread. Mr. Sullivan's world-wide experience in the study of markets has made his cooperative work in this connection invaluable to the Government.

NATIONAL SUBCOMMITTEE ON WELFARE WORK.

The definition of welfare work adopted by the Committee on Labor is:

Maintaining and improving working and living conditions of employees; especially applicable to mines, railroads, factories, stores, and public institutions.

The types of employees considered are: (a) industrial; (b) public; (c) soldiers and sailors and their dependents; (d) field mechanics in active service.

The most notable results of the efforts of the Committee on Welfare Work, of which L. A. Coolidge is chairman, and the most beneficial to the Government in relation to the successful prosecution of the war, have been achieved by the sections on compensation for enlisted men and their dependents; on housing; and on industrial training for the war emergency.

SECTION ON HOUSING.

The chairman of the Committee on Labor instituted June 28, 1917, through one of the subdivisions of his Committee on Welfare Work, an investigation of housing conditions in munitions making and shipbuilding centers throughout the country, both privately and Government owned. Mr. Philip H. Hiss, chairman of the Section on Housing, conducted the investigation at his own expense. He found that neither ships nor supplies for the armies in Europe could be adequately forthcoming without shelter for the workers and that there must be Government financial aid in many instances as local capital had practically been exhausted where enormous contracts had been placed by the War and Navy Departments and Shipping Board.

He further found that in a number of instances 50 per cent of the machinery was idle and that 50 per cent of the output of some of the shipyards was held up, with labor available, because there were no places for the men to sleep, that exposure of these workers during rigorous weather made continuous labor almost impossible, and that inadequate transportation to and from the work places added to the difficulty.

As a result of investigations growing out of the work of this committee, the Emergency Fleet Corporation was authorized to expend \$50,000,000 for housing shipbuilders, and \$60,000,000 was appropriated for housing Government employees at Washington and workers

in war industries. The President directed the Secretary of Labor to administer this fund.

Mr. Otto M. Eidlitz, the chairman of the Committee on Housing of the Council, was appointed director of the Bureau of Industrial Housing and Transportation of the Department of Labor, and, pending the appropriation by Congress, he worked in a preliminary way among the departments concerned—the Navy and War—building up an organization of architects and other experts, and undertaking topographic work in which there were concerned at least a dozen large projects. A corporation was formed entitled the United States Housing Co. (Inc.), Mr. Eidlitz, president, under which the housing program of the Bureau of Industrial Housing and Transportation of the Department of Labor is being executed.

SECTION ON INDUSTRIAL TRAINING FOR THE WAR EMERGENCY.

This section of the Welfare Division of the Committee on Labor is composed of one-third labor, one-third employers, and one-third practical educators. State committees similarly organized have been developed where war products are being made. There are at present nine associate branch committees of the Section on Industrial Training, covering, respectively, Illinois, Indiana, Michigan, New England, New Jersey, New York, Ohio, Pennsylvania, and Wisconsin.

Sixty-five vestibule schools, so called because the workers are introduced into the shops through them, have been organized in aeroplane plants, heavy ordnance, small arms, and other essential war trades. A great many plants, probably 300, have instituted some form of training, but this report deals with vestibule schools proper, having quick, intensive, modern training. All the 65 training schools mentioned are on a production basis at all times with speed and accuracy as the watchword. The section advocates that in such training rooms or vestibule schools three tests should be made, with reports submitted daily. These tests are:

(1) How many operatives are sent into the factory? (If this were the only test they might be sent in too fast and only partly trained.)

(2) Cost, net, after crediting production which should equal the shop average.

(3) Wastage. There should be none. There should be 100 per cent Government inspection.

Every vestibule school, because of the thorough training given, has yielded from 10 to 40 per cent increase in production, both for men and women, and the labor turnover has been reduced materially thereby.

Great care has been taken to advocate that unemployed men be adapted and trained in new trades for the period of the war and that

unskilled men be educated wherever possible before resorting to the employment of women. In spite of this persistent effort it appears that the women have been taken largely into various trades and that their adaptability and readiness in taking training has developed a problem, the solution of which will require much earnest consideration.

It was shown in a recent investigation by the State of Massachusetts, where the unemployed numbered 10,866 men, that there were in that number only 227 machinists. The enormous demand for skilled machinists and toolmakers in this world war of machines has made it clear, the report continues, that training must be directed toward those special trades to a large degree, and the effort is to train skilled men from dull trades to war production. Unskilled and inexperienced workers are being trained to become efficient operators on machine tools, either in regular machine work or tool work, by subdividing the processes and training the recruits upon the work under exact shop conditions. Women are coming into the factories in daily increasing numbers and are proving themselves successful machinists. In plants where the vestibule school is in operation and where women are successfully employed the care of these women by means of the best welfare methods is also noticeable.

The magnitude of the work of the Section on Industrial Training as it has developed in the last few months is such that it is impossible to describe it in detail in this report. It is equally helpful in small cities and small plants and in large ones.

A fact which, however, should not be overlooked is the possibility, if not the probability, that having secured the cooperation of employers, representatives of employees, and educators in this emergency work, the end of the war may find all three moved to develop together vocational education. This will tend to bring into the apprentice system young people with a foundation of vocational education who by virtue of this training will the more quickly be able to advance through the apprenticeship period to take their positions as skilled mechanics.

EXPERIENCE OF NEW JERSEY.

As an indication of the possibilities of this development, the experience of the State of New Jersey cooperating with this section may be cited. In order to overcome possible objection which labor might have to the introduction of emergency training, a program was agreed on, after a series of conferences, which was approved by the employers and the representatives of the employees. Before giving their approval the latter had referred the program to the local unions, which expressed hearty cooperation and desire to develop

this emergency training to the fullest extent. Some of the clauses of this agreement are as follows:

All skilled labor available within the surrounding territory should be brought into the essential war industries before it is unduly diluted by the introduction of unskilled labor. When such dilution is necessary, and, in the opinion of the committee, that time has already arrived, the more skilled activities should be supplied by training those already at work and successful in handling the lesser skilled activities of the same general type. The lesser skilled activities should be supplied by training those already skilled in nonessential activities and not engaged at present in essential war industries, and who, because of such skill, are peculiarly capable of quickly learning the rudiments of the new activities.

The Federal-State-Municipal Employment Service is particularly well fitted to assist in locating such skilled labor as is unemployed or available in non-essential industries, and the committee recommends applying to this service in all cases in which skilled labor is not otherwise obtainable.

Exploitation of labor and reduction of wages through dilution for war purposes is to be avoided, and to this end persons brought into an essential industry, or promoted from one grade of work to another, are to be paid the prevailing rate of wages for the class of work for which they have been trained after a training period of reasonable duration.

Dilution of labor by the employment of women when necessary is recommended, provided women receive wages equal to men for the class of work performed by them and provided the working conditions surrounding their activities are carefully controlled for their comfort and well-being.

To stimulate effort and arouse interest in training the idle and potential workers in each community, as well as to facilitate the upgrading of the old operatives, Mr. H. E. Miles, the sectional chairman, has traveled extensively among manufacturing centers for the past 12 months addressing leading metal, machine-tool, and other manufacturers' associations. He has also actually assisted in the establishment of vestibule schools in the plants.

One interesting result of training resident unemployed is the practical elimination of the housing problem in certain instances. This is exemplified in the city of Detroit, where it is estimated that 50,000 additional mechanics will be needed before the end of the year. If those now engaged in the war plants could be advanced to more skilled positions and their places filled by present residents of Detroit engaged in nonessential or unskilled industries or those not now at work, the need for housing of the 50,000 mechanics with their families could be, if not entirely, at least in part, eliminated.

In April there was established in the plant of one of the larger airplane companies a vestibule school, where one of the foremost training experts of the country has been engaged. It sends into the factory trained workers at the rate of 6,000 a year. The firm had employed previously 3,100 men in one month and lost 1,600. Its cost, like that of the other firms, has been \$50 per new man secured—i. e., for the 3,000. It recently instituted the proven method

of England and France as respects training new workers. The vestibule school which it established became a small airplane-production factory, with every machine and instructor perfect for the task. As men proved unavailable they advertised for women of high moral character, "preferably with relatives at the front." They visualized the school as a part of the trenches. At the end of six weeks they were training splendid women in from two to six days each, for airplane production is simple.

The chairman of this section had the leading expert from the Ministry of Munitions in London to assist in the development of the heavy ordnance standards for training, and on June 1 installed a vestibule school at one of the great steel plants surpassing in size the one above mentioned.

COMMUNITY EFFORT.

In some instances the training of the unskilled to become skilled is a community matter. One great war center, where there are placed \$875,000,000 worth of war orders, has a training room in each of 12 of its leading war factories. This community needs 25,000 more skilled workers now and 25,000 monthly until January 1, and it has taken this practical means of making its own workers rather than acquiring them to the disadvantage of other communities.

Heretofore it has been commonly held that there is little opportunity for training and upgrading in the textile industries, but several of the most important of the manufacturers in this line are undertaking to develop training in their plants, insisting that much can be accomplished for the betterment of their workers.

One of the lines of endeavor of this section has been to keep record of the leading war factories of the country and to supply these manufacturers constantly with the best matter on industrial training, including valuable data from England's experience. For instance, the section has disseminated the information that factories in England and France are obliged by governmental order to have training in their plants in order to keep up the supply of skilled workers. The section has also continually sent literature to its list indicating the gain in production from training rooms where started, the opportunity to decrease labor turnover which training offers, and the best places where men can go to see this training in operation.

Some of the most skilled industrial training experts in the country have been placed with those plants making goods such as airplanes and ordnance which employ large numbers of operatives and especially need training. More than this, the understanding is that these experts so placed may go about their neighborhoods upon request of other manufacturers to give their services in starting training rooms in other plants.

The section has cooperated with governmental departments, particularly the Ordnance Department, and is now engaged in one of the districts in this country which has a tremendous amount of war orders in opening up training rooms through all this congested and heavily tried section. Certain governmental agencies are recommending that hereafter contracts for war materials shall include an obligation upon the contractors to train operatives in their work, as in England and France.

PUBLISHED REPORTS OF WELFARE COMMITTEE.

Industrial, scientific, and health experts, at great personal sacrifice, have been working for months on special reports. Three have been issued which should aid employers in conserving the health of the workers in their plants. They form a part of the welfare work series and are:

1. "Industrial Fatigue."
2. "Manufacture and Loading of High Explosives."
3. "Code of Lighting."

Other important reports have been submitted by committees upon "Ventilation," "Abnormal Atmospheric Pressures," "Diagnostic Clinics," "Physical Examination of New Employees," "Medical Supervision," and "Village and Public Sanitation."

STANDARD PHYSICAL EXAMINATION CARD.

The Committee on Diagnostic Clinics has under consideration a standard physical examination card. With the centralization of the recruiting of labor it seems to be necessary, in order to prevent duplication of medical examinations, to have a standard card and to have proper classifications similarly adopted in every district. A conference under the auspices of the Welfare Committee of the Committee on Labor, presided over by L. A. Coolidge, was held recently at the headquarters of The National Civic Federation. The following resolution was adopted:

It is the sense of this conference that the physical examination of the workers is primarily a measure of health conservation and also essential to maximum production—a war necessity;

That the purpose of a medical examination is not to eliminate the worker from industrial service but to adapt him to the work he is physically fitted for.

Therefore be it resolved, In view of the publicly announced policy of the Government centralizing the recruiting of labor in the United States Employment Service, that this conference recommend that medical examination of the workers be one of the functions of the Government Recruiting Agency.

It further recommends the establishment of a central examination board, composed of representatives of the workers, employers, and the Government.

That this board issue examination cards indicating the health of the workers and classify according to physical fitness.

Such a system of centralizing physical examination of workers does not prevent employers from maintaining their own systems of physical examinations and the follow-up methods for the purpose of conserving the health of their workers.

A subcommittee was authorized to revise the card submitted by the Committee on Diagnostic Clinics. There were present labor leaders whose trades are concerned with war products, employers, Government agents, and experts.

In closing the meeting Samuel Gompers said:

When we realize that it is just about a year and three months that we have been in the war and that during that time we have created an army of nearly two millions of men, that we have safely landed over a million soldiers 3,000 miles away, that we have conserved the health, comfort, and safety (as far as it is possible to provide for safety) of our men in the camps and on the fighting line—when we consider that this has all been done by a democracy that formerly said it was no man's business except his own to take care of himself or see that his health and comfort should be looked after—we realize what a wonderful transformation has been brought about in a little over a year, as evidenced by these achievements.

I took occasion to say last night, in referring to the claim of imperialism and autocracy that there is no efficiency except in such a system, that they leave out the human equation, and that when the spirit of democracy is aroused there is no sacrifice too great in order that a given result can be accomplished. And when you think that this has been done in our democracy—and for practical purposes we are now about as big an autocracy as possible, in order to bring about a military machine temporarily—it will be seen how we have yielded everything for victory, and that in the process we are looking after the human side of the people, as is shown by the gathering here to-day.

There can be no question as to the wonderful effects that such a movement as here proposed will bring about. It is only a matter of education before employers throughout the country will come under this rule that people generally should be physically examined and that the examination should be standardized—at least the minimum.

Well, we are thinking in such terms now as would have been impossible if we had not gotten into the war. I feel that we are going through a baptism of fire that will make for quicker, and better thinking and a better conception of life. It seems that in this world's history it has been clearly shown that no human achievement of a tangibly great character has ever been accomplished or ever will be accomplished except through a baptism of fire. It is the sanctification of such achievement—and I have taken occasion to say that the newer conception of man's interdependence upon man; the establishment of new relations between man and man as well as the new relation between nation and nation; the question of the centuries, "Am I my brother's keeper?" is being answered now and answered in the affirmative. We are our brother's keeper! You can not help it; you can not get away from it, and the sluggishness of thought and the heavy handicap upon the feet of progress have been cut away and we are thinking more clearly and keenly and acting better in one comprehensive whole—first, to win this war, to root out autocracy, tyranny, and injustice of all sorts, as far as it is humanly possible to wipe them out, and at last to give the opportunity for the development of a higher and better mankind.

DIVISIONAL COMMITTEES.

The Divisional Committee on Industrial Fatigue has conducted investigations in factories manufacturing war supplies for the purpose of determining whether unnecessary fatigue is present and discovering the safe conditions under which a maximum continuous output may be obtained. Its preliminary report is intended chiefly for manufacturers. It deals not only with the means of detecting fatigue, but the introduction of rest periods, providing adjustable seats, omitting unnecessary motions, proper ventilation of work-rooms, adjusting the hours of work, avoiding overtime, omitting Sunday work, and sanitary conditions outside of factories.

The Divisional Committee on Industrial Diseases, Poisons, and Explosives in its report on the manufacture and loading of high explosives covers 30 topics, among the most important being washing and eating facilities with reference to the prevention of poisoning. The chairman of the Section on Sanitation, Dr. William A. Evans, under which this committee operates, inaugurated conferences with employers in the industry before the adoption of the report. The manufacturers' representatives agreed without exception to adopt the rules and regulations in the report as the practice for their establishments and they have circulated large numbers of copies in their plants to that end.

The chairman of the Committee on Labor appointed upon the Divisional Committee on Lighting in each State a member of the Illuminating Engineering Society, nominated by its president. The "Code on Lighting" has been sent to the head of each State bureau of labor, who is being consulted by the State member of the lighting committee with reference to the best means of enlisting the interest of employers voluntarily to adopt this means of protection for the workers and of securing its adoption as the official State code, one industrial commission having already taken that action.

All these reports have been sought by manufacturers, educators, and officials of labor organizations. Powder companies are asking for them in large quantities. By request, the Sheffield Scientific School at Yale was provided with a supply adequate for the senior mechanical engineers, and the division of education at Harvard University was furnished with a similar quantity to use in its war emergency course for employment managers, now in session. The secretary of the Detroit Federation of Labor, upon motion of that body, asked for copies of each report, expressing its appreciation and interest in the welfare work of the Council of National Defense. Similarly the industrial commission of Wisconsin asked for and was given copies of these reports to distribute among its deputies. Other State and Government commissions, the Housing

and Health Division of the War Department, and the Industrial Relations Service of the Shipping Board, secured copies to distribute.

These three published reports, being limited in quantity, as the cost was privately borne, have been distributed only upon request. The demand has been continuous. It is gratifying to report that the United States Bureau of the Public Health Service is reprinting them, enabling the Committee on Labor to put an increased number into circulation; also that the Public Health Service is distributing copies among manufacturers whose plants are under inspection by it.

SECTION ON INDUSTRIAL SAFETY.

This section, of which Mr. L. R. Palmer is chairman, is subdivided to include "Structural Safety," "Fire Prevention," "Accident Prevention," and the protection of workers against injurious "Dust and Fumes." It recommended that to secure at least minimum standards of safety for the protection of workers engaged on Government contracts it would be necessary in letting such contracts to include therein a code of minimum safety requirements—in transportation, mines, industrial, and commercial establishments; Government establishments, and the marine service. This was considered especially important in view of the fact that in many States there are no safety requirements either with regard to fire prevention or accident prevention, and the committee stated that only by the adoption of basic minimum standards of safety in each field would it be possible to introduce these elements. Exhaustive codes were prepared by leading experts and were recommended to the Advisory Commission for adoption in so far as it might be practicable.

The Section on Industrial Safety is in a position to offer the services of thousands of trained inspectors, members of the various technical associations, to cooperate with existing State and Federal agencies. Particularly have the National Council of Safety, the American Institute of Architects, and the National Fire Protection Association, including the National Board of Fire Underwriters, with its large staff of trained men, offered their services. It is hoped that this work may develop in such a way as not to handicap contractors in speedy production but at the same time to make the workers not only efficient but safe in their employment.

Special effort has been made by the Division on Industrial Accident Prevention to have included standard safety devices in the equipment of all machinery at the time of its manufacture or before its installation by appeal to the Supply and Machinery Manufacturers' Association to take suitable action in connection with specifications for all contracts for machinery.

There has been recommended a central bureau for inspection service, to act in cooperation with State technical and welfare com-

mittees, covering fire prevention, accident and health, sanitation, housing congestion, and German trespassers. It has also recommended that this proposed organization should be so constituted that it would have in its central bureau experts who could suggest in the various communities methods of inspection. While this service is designed primarily for the protection of the workers, it is believed that contractors would profit by the service because of the reduction in fire insurance and accident and health insurance, and the Government would profit, because it would run a minimum risk of losing the product.

HOME NURSING.

The Division on Home Nursing of the Committee on Welfare Work, organized to furnish information concerning industrial nursing service and to make it available, has issued a circular, which has been sent by the chairman of the Committee on Labor to 22,000 trade-unions, urging them to request the employment of nurses in industrial plants and that the members of their families make greater use of public-health nurses in their communities; also that the trade-union influence be exerted for the extension of nursing service in rural districts. The purpose of this appeal is to guard the physical condition of our men and women in industry and their families in their homes as a national obligation to safeguard our body of citizens at this crucial time.

Appeals have been made to the manufacturers' associations and other similar bodies suggesting that some employers have recognized the value of this service and have already placed nurses in their plants, and that if generally established it would prove to be a valuable aid to efficiency and economy in every kind of employment. The appeal also contains the following:

Provision for the care of employees of both sexes and of their families is particularly justified at this time because of the extra hazards under which many of them work in war industries.

A card catalogue descriptive of the nurses, their functions, locality, etc., has been filed, and, if used, would make available the services of approximately 6,000 public-health nurses. With so many doctors and nurses removed from the country for the Army and Navy service, the community health is to a large extent dependent upon these nurses.

May we count upon you to urge through your organization the placing of additional nurses in industrial plants, and that you stimulate the members of your organization to make use of the nurses in the community?

SECTION ON RECREATION.

This section, which is in process of organization, will confine its efforts to shipbuilding, aeroplane-making, and munition-making centers. It has made preliminary surveys of conditions indicating the necessity of providing requisite recreation outside munition-making

plants to give complete change and relief from the tension under which many employees are working, and has prepared, after conference with representatives of various Federal departments, recommendations upon minimum standards for entertainment and athletic features of social life, together with proper municipal or State regulations.

The preliminary plan includes the following, in the belief of the committee that if our industrial army breaks down because of disease or is weakened by debauch, or falls in any degree away from that physical power which is attendant upon good health, the consequences are as far-reaching as a break in the lines more directly concerned in fighting. A healthy worker is the most productive worker. Recreation which conduces to good health and lessening of fatigue indubitably increases production. Admittedly, good health and physical fitness may be promoted by far-seeing policies of recreation, both public and private. The next generation of workers and fighters must be protected through our girls and younger women and trained through our boys. It is conceivable that whole communities and whole plants may be irreparably injured by a short-sighted or vicious recreation policy, or, as so often happens, by the total absence of one.

For the purpose of approach, it seems best to divide the program proposed as minimum standard into two parts:

1. The industrial plant itself.
2. The industrial community.
 - a. Existing communities where the industrial development is merely an addition to the normal life of the town.
 - b. Large governmental plants that constitute a community in themselves and create out of nothing a town.

1. **THE INDUSTRIAL PLANT ITSELF.**—Frequently conditions of work in a large plant are such that recreation facilities and programs beyond what is ordinary provision for the welfare of employees are both inadvisable and impractical. In industries working on shifts, closely regulated as to time, where space is limited, little can be asked beyond rest rooms, perhaps provided with music and possible provision for baths. These are so fundamental, however, as to come under the head of proper physical care or welfare rather than recreational program.

No plant, however, is so limited that it can not provide through a resourceful welfare department a simple program of healthful recreation for its workers. Such programs can be developed in great detail. Common forms are—

For men.—Baseball, on the grounds, if practicable, if not, outside. Inter-departmental baseball contests; games with men from other plants. Bands or orchestras—these entail initial expense for instruments. This, however, is outweighed by the usefulness of the organizations and by the recreation afforded

by rehearsals and participation in plant affairs of all kinds. Glee clubs and community singing. Gymnastic exercise, either in plant or in outside gymnasiums. Athletic contests, interdepartmental or with other plants, developing into a field day, possibly on a holiday—if such are given during the pressure of war time.

For women and girls.—Dancing—folk and social; glee clubs, choruses, community singing; gymnastic exercises, either in plant gymnasiums or outside. Walking clubs; gymnastic and outdoor exercise can be organized along the lines of the public-school athletic league of New York City, where both pupils and teachers do all the work voluntarily after school hours; dramatic clubs; musical clubs.

For men and women.—Properly supervised dances and other entertainments, either on plant premises or, under plant auspices, outside. For these, bands, orchestras, community singing, etc., can all be utilized. All of these promote esprit de corps and have a very positive effect on the health and morale of workers.

Near-by resorts should be utilized under supervision and restriction. Excursions and field days, when time permits, may be organized.

In reality the recreation program of a plant depends on the initiative of the management and its appreciation of the value of such a program. As much or as little or more than is here suggested can be readily developed with little expense and a maximum of return in health and vigor, and especially in productivity.

Noon-hour recreation.—This should be carefully regulated so as to be recreative and restful at the same time. Quiet recreation, moderate dancing, or ball-playing are best; gymnastic exercise is out of the question. Only such forms of exercise as promote rest and do not increase fatigue should be included.

2. THE INDUSTRIAL COMMUNITY.—Existing communities where the industrial development is merely an addition to the normal life of the town.

Much of the leisure time of workers in large industrial plants will of necessity be lived in the community. If wise provision is made for recreation, workers who now have unaccustomed amounts of money to spend, and, due to the eight-hour day, increased leisure time, go back to work stimulated and ready for real work. The policy which does away with wholesome public recreation because of expense, and invites workers to spend time in unwholesome places is iniquitous and direct in its destruction of man power.

Therefore the community has both a restrictive and constructive responsibility toward its residents, and must develop programs of recreation that meet both responsibilities.

Many communities have now a large population of unattached men. Some are married men living temporarily away from their families, and all the more in need of wholesome amusement to fill leisure hours that are unusually lonely and unusually unrestrained, due to the absence of home environment. Large numbers of men brought into strange communities and left without amusement resources are a menace to the girls of the community, and left to themselves they risk contamination.

CONSTRUCTIVE PROGRAM OF THE COMMUNITY.

Each community should have a minimum standard of regulations of public amusements. As a result of its studies the section has reached the following conclusions:

(1) There should be at once established, either by local enactment or through Government regulation, definite legal control of all public amusements in industrial communities. The Government agency in charge should be prepared to submit to local communities simple forms of regulatory ordinances for public amusements.

(2) Moving-picture shows should be licensed ; pictures shown should be subject to some form of censorship.

(3) Dance halls should be licensed and regulations established as to closing hours and the sale of liquor. The sale of liquor should be prohibited where dancing is permitted. Safety and fire regulations should be applied to all dance halls, as well as standards of sanitation. The same regulations should be made to apply to picnic parks where there are dance platforms. In picnic parks lighting should come up to a minimum standard of illumination.

(4) All public amusements, restaurants, and all places where liquor is sold should have a definitely prescribed closing hour, rigidly enforced.

(5) Excursion boats should be regulated through the cooperation of the Department of Commerce, under whose jurisdiction they come.

The abolition of existing programs for recreation, such as the cutting from budgets of appropriations for parks and playgrounds, as has been done by some industrial communities, is a shortsighted policy. (1) Public parks, playgrounds, outdoor and indoor public gymnasiums, swimming pools, band concerts, and public beaches were never needed as now. (2) Public schools should be utilized at night. (3) Community councils in accordance with the suggestion of the President should be formed in every community. In these community councils the problems of community programs, both restrictive and constructive, can be discussed and their provision stimulated. (4) Proper play develops clean ideals. If the next generation is to grow up to take its place in the ranks of either workers or fighters we must become a healthy Nation, full of wholesome men and women. Family recreation in public parks and at public beaches should be encouraged.

LARGE GOVERNMENT PLANTS.

For large Government plants the following suggestions are being recommended:

(1) Proper recreation halls. (2) Gymnasias. (3) Outdoor field for baseball, etc. (4) In general the program suggested for the indi-

vidual industrial plant to be followed out. (5) The development of the natural resources offered by the surrounding country. An industrial plant of this kind is sometimes situated on a water front. The development of water fronts, with their resources of bathing and boating, would be most helpful.

PUBLIC HEALTH EDUCATION. •

The section on Public Health Education was organized to prevent outbreaks of infectious diseases due largely to a lack of knowledge of the proper care of the body. By restricting its efforts to home instruction, it believes there will be no likelihood of invading the domain of any governmental organization. The importance of this work is enhanced by the increased cost of living and the desirability of avoiding, as far as possible, the expenditure of any part of the wages for medical care and treatment of disabled members of the worker's family. The educational campaign now under way involves information concerning the laws of personal hygiene and the means by which infectious diseases are transmitted. It is recognized by this committee that the disturbed conditions of the household, when sickness occurs, involves loss of sleep to the wage earner, and the necessity frequently of eating improperly cooked food, which affect the value of his services and reduce his productive capacity.

The three special factors recognized by this committee as being important in the education of the public concerning the preservation of health are:

1. The dissemination of information which emanates only from authoritative sources;
2. General education upon the subject throughout the country that all may receive like instruction; and
3. The selection of proper agents and means by which the information may be conveyed to the homes of those in need of this education.

The means to be employed are the trained nurse who visits the home and personally instructs members of the household; pastors of churches; heads of organizations to which wage earners belong, particularly those of foreign birth; and moving pictures as well as health bulletins.

This central plan of operation for national action involves co-operation with societies throughout the United States and State and municipal health departments. While this work as inaugurated is especially applicable to war times, it is of vital importance during both peace and war and will endure to protect the home. It has a direct bearing upon the making of good soldiers, as many persons are rendered unfit for military service because of deafness, impaired

vision, and other disabling conditions occurring during childhood as the result of diseases which may be prevented, in the opinion of Dr. Alvah H. Doty, chairman of the section.

STATE WELFARE COMMITTEES.

State welfare committees are in process of appointment to co-operate with State health and labor boards and to make the National Committee on Welfare Work more readily accessible in the various sections of the country. These State committees are to consist of five members, two to be named by employers, two as representatives of labor already nominated by State Federations of Labor, and one other who is recognized from his standing in the community as acceptable both to employers and labor, preferably to be selected by these four. These State welfare committees are to be understood as operating in the jurisdiction of the State councils of defense.

Reporting to these State welfare committees are to be State groups of technical experts consisting of members nominated by the proper officials of the following great national expert associations: The American Public Health Association, the National Fire prevention Association, the American Society of Heating and Ventilating Engineers, the Mining and Metallurgical Society of America, the American Association of Industrial Physicians and Surgeons, and the Illuminating Engineering Society.

NATIONAL COMMITTEE ON WOMEN IN INDUSTRY.

The Committee on Women in Industry was appointed to advise on women's employment in such ways as to bring about the maximum effectiveness of the woman power of the country.

Its attitude has been that to save wastage of woman strength is even more essential than to avoid waste of materials. Wage-earning women must be assured such hours and remuneration and such conditions of work as will promote their fullest working capacity. Only by preserving health and general welfare can this be attained. Woman's labor must reach its highest efficiency.

The committee has a membership of 84 women, 35 of whom are representatives of labor. The remainder are experts on labor problems and representatives of the employers and the general public. The official status of the committee makes it necessary to secure representation of all the interests of the community.

The work of the State committee in 23 States is supervised by the national committee. It cooperates with them by drawing attention to problems of national importance which may arise in their various territories. It coordinates the work of its State committees by keeping an oversight of the entire field and serves as a channel of communication in reporting to the Government.

An important part of the State work is to assist in securing enforcement of labor laws. This means close cooperation with State factory inspectors, a concerted effort to stimulate their activities, and, where necessary, to create public sentiment that demands efficient work on the part of the inspectors.

A most important economic change confronting the country is the employment of women on work customarily done by men. Wherever this change is contemplated or is taking place in any industry or occupation the committee believes that inquiries should be made immediately. The health of the women should be especially considered. Wherever, for instance, the work requires them to carry heavy loads, to work on heavy machines, or to stand for long periods it will be necessary to modify the processes.

The following is the committee's attitude:

Women are entitled to be paid the same rates as men receive for identical work. If the processes are not identical, wages must be adjusted according to the skill and output of the worker. There is real danger that war needs will be used as a pretext for cutting down wages. Every effort must be made to combat this tendency and the consequent lowering of the standard of living.

The work of the Committee on Women in Industry has been carried on through three channels: (1) Through its executive committee directly, (2) through its standing committees, (3) through its State representatives.

STUDYING CONDITIONS.

The most important activity of the executive committee has been that of securing information concerning the employment of women in the United States arsenals and quartermasters' depots. Detailed reports of the conditions of work in these places and recommendations for changes have been made to the departments concerned. The reports were received with appreciation and made the basis of action by the departments.

One of the early studies was made of the Brooklyn Navy Yard. The report resulted in many recommendations being put into effect. Other studies and reports were made on women workers at the Frankford Arsenal, at Frankford, Pa.; at the Picatinny Arsenal, at Dover, N. J.; at the Schuylkill Arsenal, in Philadelphia; on the work given out from the quartermaster's depot at Jeffersonville and the substations of that depot, where more than 21,000 women receive work to be done in their homes; on work at the navy yard in Philadelphia and in the factories at the Charleston Navy Yard.

The committee has been helpful in making suggestions and protecting women engaged in war work on railroads. It suggested to the Director General of Railroads the appointment of a board of experts, including a physician, a safety expert, and an expert on indus-

trial fatigue, to study all occupations in which women are engaged and to determine proper conditions of employment.

The committee adopted standards for the employment of women on work for war supplies. These standards deal with tenement-house work, child labor, protection of mothers, wages, hours of work, seats, extra heavy and hazardous occupations, dangerous trades, lifting, and exposure to heat and cold.

The various subcommittees of the Committee on Women in Industry report the following:

The committee on foreign-born women, in addition to a general oversight of the problems which are peculiar to the non-English-speaking woman in war industries, has rendered a valuable service in issuing to the foreign and labor press a series of bulletins in foreign languages. Subjects dealt with in these bulletins are accident, fatigue, industrial standards, sweatshop work, and working mothers of small children.

The committee on colored women has a trained colored worker in the field and a program for dealing with the special difficulties which colored women at work have to face.

The committee on living conditions has held conferences with Government officials and other agencies with regard to housing and general living conditions of women workers in the new industrial war centers.

It is to be hoped that when the war shall have come to a victorious end, the standards adopted, having functioned to bring about a better condition of life and work, will not be abandoned, and that permanent benefit will accrue from them.

GENERAL MEDICAL BOARD AND MEDICAL SECTION.

The work of the General Medical Board has been the following out and development of steps previously taken, dating back to April 26, 1916, when the Executive Committee of American Physicians for Medical Preparedness tendered the services of the organization to the President of the United States. In order that the picture may here be fairly complete, these earlier steps may be summarized:

April, 1916.—Committee of American Physicians for Medical Preparedness created by joint action of presidents of American Medical Association, American Surgical Association, Congress of American Physicians and Surgeons, Clinical Congress of Surgeons of North America, and American College of Surgeons to formulate plans whereby civilian medical resources of the United States might be effectively coordinated for such purposes as might be required by the Federal Government. State committees appointed, and county committees later organized.

April 26, 1916.—Services of Committee of American Physicians for Medical Preparedness tendered to the President of the United States. Offer referred to Secretary of War and Secretary of the Navy.

Spring and summer, 1916.—Surveys of hospitals and sanatoria instituted by above committee; information as to capacity of 1,700 leading institutions secured.

December 6, 1916.—Organization of Advisory Commission of Council of National Defense, which requested Committee of American Physicians for Medical Preparedness to continue activities under direction of Council's Committee on Medicine and Sanitation.

Late fall of 1916.—Committee requested by Surgeon General's Office of the Army to assist in arousing interest of civilian medical profession in Medical Reserve Corps with view to increasing enrollments.

December, 1916.—Conference in Washington of deans of medical schools to aid Navy in securing desirable young men for its Medical Corps. Attended by representatives of a large number of medical schools in the country, and recommendations that senior medical students enroll in Medical Corps of the Navy, and that a short course of medical-military instruction be included in the curricula adopted.

January 6, 1917.—Meeting of the deans of medical schools to discuss military medical training of students. Attended by 87 representatives.

March, 1917.—Fifty medical societies requested to furnish lists of members fitted to perform special work for the Government.

April 28, 1917.—Meeting of deans of the medical schools to discuss continuous teaching, and the danger of disorganizing medical schools and civilian hospitals. Forty-six representatives present.

April, 1917.—Twenty thousand copies of the pamphlet, "Information Regarding Correlated Activities of the Council of National Defense and the Advisory Commission, the Medical Departments of the Government, and the Committee of American Physicians for Medical Preparedness," were published.

April, 1917.—As a result of the conference with members of the British and French missions concerning the need for medical men and supplies in cooperation with the surgeons of the Army, recommendations was made to the Surgeon General that 10 base hospitals with 1,000 beds each and sufficient personnel, and also 2,000 ambulances, be sent to France to be attached to the French and the British forces. Base hospitals were on the other side in the service of the Allies within a month.

May 12, 1917.—Conference of the Committee on Dentistry with the deans of the dental colleges and dental examining boards to discuss coordination of activities. Thirty-six deans and 20 representatives of State examining boards attended.

Although it was only on April 2, 1917, that the chairman of the Committee on Medicine and Sanitation of the Advisory Commission of the Council of National Defense was authorized by the Secretary of War to appoint a general medical board to assist him in formulating plans for the mobilization of the civilian and military medical resources of the country, the report for the fiscal year, ended June 30, 1917, showed substantial progress. The program outlined in the first Annual Report has been, in large part, acted upon and carried out during the year, together with activities then not contemplated or foreseen.¹

The General Medical Board now has 84 members, including representatives of principal surgical and medical societies, officers of the Army, Navy, and Public Health Service, and a representative

¹For account of these activities in greater detail, see pamphlet, Report of the Chairman of the Committee on Medicine and Sanitation of the Advisory Commission of the Council of National Defense, April 1, 1918.

of the Red Cross. Many of these are on active duty in Washington. There is close cooperation between the General Medical Board and the Government departments and bureaus which have to do with medicine, surgery, and sanitation. At each monthly meeting reports are presented by representatives of the Surgeons General of the Army, Navy, and Public Health Service and the Red Cross.

At the first meeting of the General Medical Board an executive committee was appointed, and also committees on State activities and examinations, legislation, hygiene and sanitation, research, dentistry, medical schools, publicity, and hospitals. To these committees have been added many others during the last year, the General Medical Board initiating very many important activities in coordinating civilian with military developments. A number of the committees of the General Medical Board have been taken over by the Surgeon General's Office, including those on research, hospitals, dentistry, general surgery, ophthalmology, venereal diseases, and those on head surgery, including also the subdivisions of otology, rhinology, and laryngology.

RECRUITING MEDICAL OFFICERS.

Effort to obtain medical officers for the Medical Reserve Corps has been continuous. Through its State and county committees, the Committee on Medicine and Sanitation early took steps to classify the medical profession according to its availability for military service and communal needs. As a result of this classification, 20,000 selected men were communicated with by the committee urging their prompt enrollment in the Medical Reserve Corps. State and county committees were instructed to hold frequent patriotic meetings and personally to interview prospective candidates. In the summer of 1917, 60,000 application blanks for enrollment were printed and distributed by the committee to prospective candidates. Medical journals, in many cases, printed application blanks in their publications. On July 18, 1918, 50 deans of dental schools met to discuss enlistment of students in the Enlisted Medical Reserve Corps, and assignment to the inactive list. On July 27, 1917, about 150 representative homeopathic physicians met and agreed to secure 1,000 physicians for the Army. Medical graduating classes have been appealed to by letter, and there has been regular communication with the deans of medical schools to the end that they might present the appeal to their graduating classes. During the past Spring special appeals for 5,000 doctors for the Army and 1,000 for the Navy, to be furnished before July 1, were received, and it is believed these needs have been fully met. Enrollments in the Medical Reserve Corps have been increased from 1,800 at the beginning of the war in April, 1917, to about 25,000 at the present time, and of these about 16,000 *are on active duty.*

The Executive Committee of the General Medical Board appointed a committee on June 11, 1917, to investigate plans for cantonments and location of camp sites. On June 13 a recommendation was made to the Secretary of War that a regulation be made and enforced that the selection of camp sites and all plans for the construction, repair, and location of buildings, water supply, drainage, sewage disposal, and other matters relating to hygiene and sanitation be submitted to the Surgeon General or his representative for approval before work is started. The Secretary approved the recommendation, and the regulation was made.

A conference called by the chairman of the General Medical Board was held on June 22, 1917, to consider the matter of reconstruction of wounded soldiers and sailors, and their reeducation and return to civil life upon discharge from the Army and Navy. As a result, the Committee on Reeducation and Rehabilitation was appointed. This body met frequently, and as a result of its recommendations the chairman of the General Medical Board presented to the Secretary of War a plan for the formation of a reconstruction board, upon which would be represented the following departments and interests: United States Army, United States Navy, United States Public Health Service, American Red Cross, Council of National Defense, hospitals and laboratories, medicine and surgery, vocational education, labor and industry. The Secretary of War instructed the Surgeon General to call a conference in Washington on January 14, 1918, to which representatives of the departments interested were invited for the purpose of formulating a definite plan of action. A bill was drafted, and at the time this report was made was before Congress, providing for the vocational rehabilitation and return to civil employment of soldiers and sailors disabled in the line of duty.

STANDARDIZATION OF SUPPLIES.

The Committee on Standardization was authorized February 2, 1917, under the chairmanship of Dr. F. F. Simpson, for the purpose of standardizing essential medical and surgical supplies and equipment, to increase speed, and reduce cost of production. Members of the committee, including representatives of the Army, Navy, and Public Health Service, having agreed upon the minimum number of essential articles, the leading manufacturers were invited to Washington to consider the problem of production. Subcommittees representing the productive capacity of various articles were selected by the manufacturers themselves and rendered valuable service by speeding up production and by frequent conferences with the various departments of Government. The manufacturers cooperated heartily, giving freely of their time, and willingly adapting their facilities to the Government needs, the result being a substantial increase in

the production of staple articles sufficient to meet the enormously increased requirements of the Army and Navy. Four catalogues of staple medical and surgical instruments and supplies were prepared and issued by this committee for the use of the Army, Navy, and American Red Cross: Part I, Surgical Instruments; Part II, Medicines, Antiseptics, Disinfectants, etc.; Part III, Laboratory Supplies; and Part IV, X-ray Apparatus and Supplies. The manufacturers' committees continued to act until the fall of 1917, when they were reorganized as committees of their respective trades.

The drug division conducted an investigation of medicinal products for the offices of the Surgeon General of the Army and of the Bureau of Medicine and Surgery of the Navy. As there are certain elements usable both for medicinal purposes and in the manufacture of explosives, careful investigation was made into the requirements for the release of these elements, with a view to preventing their finding their way into the hands of the enemy. In cooperation with other departments inquiries were made as to the reasons for the shortage in important drugs, and in many instances these conditions were relieved. Through the recommendation of the use of paper, tin, and composition receptacles the shortage in glass containers was in large part met. The Fuel Administration was informed as to the coal requirements of drug manufacturers. Similarly the Food Administration was advised that many articles coming under its control are required in medicine. Drug and chemical manufacturers and dealers were informed as to the requirements for licenses in handling explosives or as to the necessity for licenses in exporting substances which are on the conservation list. The removal from the freight-embargo list of articles demanding prompt transportation was secured. Late in the spring of 1918 these activities were largely taken over by the War Industries Board, Lieut. Col. Simpson, chief of the Medical Section, having been named as Chief of the Section of Medical Industry of the Board May 30, 1918.

SPECIAL MEETINGS OF THE GENERAL MEDICAL BOARD.

Several special meetings of the General Medical Board have been held. On August 12, 1917, a meeting was held at the Rockefeller Institute for Medical Research, New York City, attended by 46 invited guests and 31 members of the General Medical Board. On October 21, 1917, the meeting of the General Medical Board was held in Chicago during the week of the meeting of the Clinical Congress of Surgeons of North America, attended by 31 members of the General Medical Board, and also representatives of the State committees. The following day a conference of the State committees to speed up enrollment in the Medical Reserve Corps was attended by representatives from 47 States. A special meeting of the board

was held March 10, 1918, at Camp Greenleaf, Fort Oglethorpe, Ga., in connection with the dedication of the Warden McLean Auditorium, attended by 16 members of the General Medical Board and about 800 of the doctors in training at Camp Greenleaf.

All State and county committee members have borne personally traveling expenses, office expenses, postage, etc., necessary for the conduct of the committee work. These expenses during the past year have aggregated many thousands of dollars, and, together with the sacrifice of time and energy demanded of individual committeemen, furnish a concrete example of the way in which the medical profession has responded to the obligations imposed upon it in meeting the needs of the medical war program.

In response to a call for a meeting to confer on best methods of increasing enrollment in the Medical Corps of the Army and Navy and to discuss a program for enlisting the services of civilian doctors, 300 physicians and surgeons, members of the State and county committees of the Medical Section, representing every State in the Union except one, met in Washington on Saturday and Sunday, May 4 and 5, 1918. According to their custom, they attended this two-day session at their own expense. Increased enrollment in the Medical Reserve Corps of the Army and Naval Reserve Force, definite plans for enrollment in the Volunteer Medical Service Corps of physicians not available for active military service, and the provision of adequate medical service for war industries were the subjects discussed. Members of the State and county committees were urged to increase their activities as the authorized governmental agencies for mobilizing the Nation's medical resources, the Council oath of office being administered to confirm them in their official capacity. Immediate attention was directed to the pleas for enrollment of 5,000 additional members of the Medical Reserve Corps of the Army and 1,000 for the Naval Reserve Force.

The June meeting of the General Medical Board was held in Chicago, and at this time also a well-attended session of the State committee representatives was held.

Sir James Mackenzie, noted heart specialist of Edinburgh and London; Col. Sir William Arbuthnot Lane, veteran surgeon of the Zulu, Egyptian, and Boer wars, and authority on bone surgery; and Col. Herbert Alexander Bruce, of Toronto, consulting surgeon to the British armies in France, comprising the medical mission sent by the British Government to attend the annual convention of the American Medical Association, attended the June meeting of the General Medical Board and the meeting of the State and county committees of the Medical Section, Council of National Defense, in Chicago. Accompanied by the chairman of the General Medical Board, they attended the annual meetings of the American

Surgical Association in Cincinnati, and of the Massachusetts Medical Society in Boston and addressed patriotic meetings held in Detroit, Cleveland, Pittsburgh, and Philadelphia held under the joint auspices of the State committees, Medical Section, Council of National Defense, and the local medical societies.

Other important work of the past year is summarized under committee heads as follows: .

CHILD WELFARE.

The Child Welfare Committee, comprising representatives of various organizations, educational institutions, and governmental bureaus, has cooperated with the Children's Bureau of the Department of Labor and the National Child Labor Committee in the plans for "Children's Year." The committee has issued to the States, through the State Councils Section and the Woman's Committee of the Council of National Defense, a program covering the problems of the child up to the school age, and prepared the program covering the problems of the child of the school age.

CIVILIAN COOPERATION IN COMBATING VENEREAL DISEASES.

The original committee having this work in hand formulated resolutions and presented arguments at hearings arranged by the chairman of the Committee on Medicine and Sanitation before the Advisory Commission and Council. These hearings resulted in the adoption of the Government's policy. The preparatory work included the presentation of arguments before Congressmen and committees as to the laws against prostitution and alcohol and the original committee also initiated an educational campaign for medical support of the social hygiene program.

Made a subcommittee of the Committee on Hygiene and Sanitation, the work continued to develop, so that the subcommittee was made a full committee of the General Medical Board. The committee developed joint conferences of medical and lay citizens with officials to discuss plans for venereal-disease clinics and law-enforcement measures in 50 cities. Advertisers and press-association committees were organized for advice and cooperation in developing public opinion favorable to the social-hygiene program. The governors of all the States were communicated with, by wire and letter, urging recognition of the emergency and drastic action in dealing with venereal diseases. A list of eight measures essential to a successful campaign was formulated and sent to State boards of health. State pharmaceutical associations and boards of pharmacy were appealed to in an effort to eliminate advertising and sale of venereal-disease nostrums. The mayors of 1,000 cities and towns, especially in the vicinity of Army camps, were also asked to enforce existing laws and enact

necessary legislation. Through trips arranged for health officers and qualified officials, 30 States were reached and boards of health stimulated to more vigorous work. Volunteer speakers have been furnished in cooperation with representatives in civilian communities.

Negotiations have been opened with the industrial-service sections of the Emergency Fleet Corporation and the Ordnance Department for lectures in shipyards and munitions plants. A syllabus and other data have been furnished the State Councils Section of the Council of National Defense for lectures to drafted men in county meetings. Editors of health bulletins and labor journals are being kept informed regarding the progress of the campaign against venereal diseases and editorials have been prepared for health, medical, and social-hygiene publications. Partially as a result of the committee's correspondence with State boards of health throughout the country, 32 States have adopted laws or regulations requiring the reporting of venereal diseases; 11 States have organized bureaus or divisions of venereal diseases in their health departments; at least 15 States provide free laboratory diagnosis; at least 6 States provide arsphenamin free or at low cost; 16 States are engaged in educational work; only 2 States have given no indications of activity in the venereal-disease campaign.

Partially as a result of the letters sent to mayors of 1,000 cities and towns, 49 of these cities have made provision for the isolation and treatment of persons infected with venereal diseases; 51 of these cities and towns have measures requiring the reporting of venereal diseases; 43 of these cities and towns have venereal-disease clinics or advisory stations; 78 have educational work under way; and only 19 cities and towns are classified as complacent.

DENTISTRY.

In the development of the Dental Reserve Corps, the Committee on Dentistry, cooperating with the Preparedness League of American Dentists, has played an important part. The dentists generally have been patriotic, and more than 300,000 gratuitous operations have been performed by the profession to fit drafted men for Army service. The committee has cooperated closely with the deans of dental schools. At a conference held May 12, 1917, attended by deans of 36 dental colleges and 20 representatives of State examining boards, with this committee, many details aimed to coordinate dental activities were agreed upon. At another conference—July 18—50 deans discussed with this committee the enlistment of dental students in the Enlisted Medical Reserve Corps and their assignment to the inactive list. Upon the recommendation of this committee, a survey of dental and oral hospital physicians was made. An investigation

was initiated as to the relationship of trench-mouth disease and oral and general disease. In cooperation with dental manufacturers, dental instruments and supplies were standardized. Military instruction was included in the curricula of dental colleges, and special training of applicants for enrollment in the Dental Surgeons' Corps initiated. Improved courses in the Army and Navy medical schools for Army and Navy dental surgeons were recommended.

EDITORIAL.

To aid directly medical officers without military medical experience and to enable them the better to conserve the health and lives of American fighting men, the Editorial Committee was authorized to have published the following seven pocket manual war text-books:

1. Sanitation for Medical Officers, by Edward B. Vedder, M. D., lieutenant colonel, Medical Corps, United States Army.
2. Notes for Army Medical Officers, by Lieut. Gen. T. H. Goodwin, director general, British Army Medical Service.
3. Military Ophthalmic Surgery, by Allen Greenwood, major, Medical Reserve Corps; G. E. de Schweinitz, major, Medical Reserve Corps; and Walter R. Parker, major, Medical Reserve Corps.
4. Military Orthopedic Surgery, by the Orthopedic Council.
5. Lessons from the Enemy, by John R. McDill, M. D., F. A. C. S., major, Medical Reserve Corps.
6. Laboratory Methods of the United States Army, compiled by the Division of Infectious Diseases and Laboratories, Office of the Surgeon General, United States Army.
7. Surgery of the Zone of Advance, by George de Tarnowsky, major, Medical Reserve Corps.

HOSPITALS.

Continuing its work of classifying the hospitals, the committee on hospitals completed an elaborate card catalogue covering all the hospitals in the United States, all available data including nursing and social service being shown. Purchase of a limited number of portable hospitals was recommended to the Surgeon General. Offers of private houses and other large buildings, tendered to the Surgeon General for use as military hospitals, were classified and tabulated for the use of the Surgeon General's office. Suggestions to general hospitals were made, urging the organization of staffs in order to release as many as possible of their members for Army and Navy service. Pursuant to a suggestion that the Surgeon General's office work out a plan for hospitalization of returned soldiers, several maps were prepared, based on studies of military and civilian needs, showing location of hospitals, distribution of medical colleges, surgeons of class A and class B, distribution of women physicians, drafting divisions, etc. Many charts also were made for different sections of the Council of National Defense and Government departments. In-

tensive studies of hospital situations were made in several cities and States, including a study of the tuberculosis sanatoria situation in New England and the West. Numerous conferences were held with leading authorities on hospital histories to study and advise improvement in Army methods. Visits were made to Camp Upton, General Hospital No. 1, and Walter Reed Hospital. Material from France and England was secured and other data collected and furnished the hospital division of the Surgeon General's office. Important progress was made toward uniformity in names of diseases, injuries, and operations. A meeting was held April 8, 1918, at which were accredited representatives from the Army, Navy, Public Health Service, Census Bureau, American Medical Association, and medical colleges. The nomenclatures in use by the Army, Navy, and Public Health Service were fully indexed and compared.

HYGIENE AND SANITATION.

The committee on hygiene and sanitation recommended to the War and Navy Departments that the zones around camps and cantonments be placed under military control in order to protect the troops from venereal infection, and it indorsed the action of the War and Navy Departments in prohibiting the sale of alcoholic beverages within the camps and extra cantonment zones. In addition to the subcommittee on venereal diseases, now the separate committee for civilian cooperation in combating venereal diseases, the committee on hygiene and sanitation organized subcommittees on drug addiction, alcoholic control, public health nursing, tuberculosis, and health statistics. Much valuable information has been assembled, and many recommendations as to sanitary measures have been made, these subcommittees at all times cooperating with the Army, Navy, Public Health Service, American Red Cross, and civilian health agencies. The committee indorsed the enactment of legislation to establish a reserve corps for the United States Public Health Service.

INDUSTRIAL MEDICINE AND SURGERY.

As a result of a conference called January 28, 1918, by the chairman of the General Medical Board to consider medical care and sanitation of industrial workers, appointment of a committee, including representatives of the Departments of Agriculture, Commerce, Interior, Labor, and Public Health Service, and of industry, manufacturers, and the medical profession, was recommended. This committee, approved by the Council of National Defense, was instructed to proceed with the prosecution of its plan.

The committee has taken steps toward assisting: (1) To provide against unnecessary human waste in industry and society during the war; (2) to avoid preventable deaths and disabilities from accident

and disease; (3) to restore to full producing power in the shortest possible time sick and injured workers; (4) to increase output by keeping workers in good health; (5) to provide healthful places in which to work; (6) to provide healthful homes and communities in which to live; (7) to meet shortage of medical service induced by military needs. The Committee on Railway Surgeons was made a subcommittee of this body. Through questionnaires sent to the railway chief surgeons, the railway surgeons were classified as to availability for military duty or necessity for remaining at home.

LEGISLATION.

Draft by the Committee on Legislation of a provision aimed to safeguard troops from vice in the zone around camps and cantonments led to its enactment as section 13 of the Army bill. Through this committee the authorities were induced to provide for enlistment of medical students of recognized schools in the Enlisted Medical Reserve Corps, allowing them to finish their course before being called for military service. The committee sought to have the Federal Trade Commission provide for manufacture here of salvarsan and other German-owned medicinal preparations, and license to manufacture these preparations has been given to American concerns. The quantity of salvarsan which sold at \$4 and higher is now easily obtained American-made and furnished to the Government at \$1, and in large quantities at a proportionately reduced price. The committee made considerable effort to have the rank of medical officers made commensurate with the service which the Nation expects from the profession, and progress has been made by the introduction of a measure for this purpose. The latest development in this direction has been the incorporation in the Army appropriation bill (H. R. 12281) of provisions substantially as outlined in the original bill.

MEDICAL ADVISORY BOARDS.

The Committee on Medical Advisory Boards was appointed by the chairman of the General Medical Board when the Provost Marshal General in November, 1917, requested the Council of National Defense to nominate a representative man in each State to serve as medical aid to the governor. The committee met in Washington, selected the State representatives, called these representatives to a conference and gave them their instructions. The committee outlined the duties of these aids in selecting personnel of medical advisory and local boards and supervision of medical activities under the selective-service law, the rules of procedure being approved by the Provost Marshal General. Practically all of the governors have expressed their gratification at the way in which the aids have cooperated with them.

MEDICAL SCHOOLS.

The Committee on Medical Schools took steps to survey the medical-school situation in order that the future supply of medical men might be conserved by inducing the students to continue their medical education in order that trained rather than untrained services might be at the disposal of the Government. The medical schools were urged to reduce their faculties to a minimum in order that as many teachers as possible might be released for enrollment in the Medical Reserve Corps. The schools furnished the committee with lists of those necessary for the successful operation of the institutions. Through the efforts of this committee third and fourth year students subject to the draft were allowed to enlist in the Enlisted Medical Reserve Corps and placed on inactive duty, in order that they might complete their medical education, with the understanding that they would apply for commissions in the Reserve Corps upon graduation. Letters were sent to presidents of universities and colleges asking them to advise premedical students to enroll in the medical schools of their choice as soon as possible.

NURSING.

The Committee on Nursing, including in its personnel the heads of the nursing services of the Army, Navy, Public Health Service, and American Red Cross, as well as the leading representatives of the profession, has sought to coordinate the nursing resources of the country in such a way as to be of greatest value to the military medical departments. In addition to making a comprehensive survey of the nursing situation in the country, the committee has made direct appeal to graduate nurses to enroll in the various Government services, and has sought to enlist the interest of young women in nursing as a career.

The nursing survey, although returns were incomplete, showed 98,162 graduate nurses, of whom 66,017 were registered, in addition to 14,387 graduates in 1918. It also showed 50,124 student nurses in schools. Numerous appeals were made to graduates whose names were obtained by correspondence with superintendents of hospitals, superintendents of training schools, State boards of nursing examiners, and nurse registries. Leaflets, pamphlets, and monographs calculated to arouse the patriotic interest of the graduate nurses have been sent in large numbers.

To interest educated young women in the appeal that they enter the field of nursing as a war service and as a profession the committee has communicated with presidents and deans of women's and coeducational colleges and universities, principals of high and private schools, and directly to recent graduates of these institutions.

In addition to sending a large amount of nursing literature to prospective nursing students a preliminary publicity campaign in newspapers and magazines was conducted. The committee has urged superintendents of accredited nursing schools to make every effort to increase facilities for accommodating more students, and investigation this spring showed that, as a result of the appeal to young women to take up nursing and of the appeal to schools to increase their accommodations, a total of 7,022 additional students were admitted up to the end of the spring term.

PLANS FOR CAMPAIGN.

The effort to enlist the interest of these young women is culminating in a campaign, plans for which are practically complete, for 25,000 student nurses for the United States Student Nurse Reserve, in cooperation with the American Red Cross and the Woman's Committee of the Council of National Defense. The committee recommended that accredited training schools giving a three years' course crowd forward the theoretical instruction and hold final examinations as early as possible in 1918. It authorized and indirectly prepared the details of an intensive preparatory nursing course for college graduates, given at Vassar during the summer of 1918, this course being open only to women registered for two years' additional training in an accredited school. Recommendations, approved by the Army and Navy Nurse Corps, regarding adequate housing for nurses, a minimum of 1 nurse to 6 acutely ill men, and that not less than 25 nurses over the prescribed quota be stationed at each hospital for emergency and to secure special training in the Military Establishment, have been favorably received by the Surgeon General of the Army and the Secretary of War.

On recommendation of the committee, Miss Annie Goodrich, president of the American Nurses' Association, has been appointed by the Surgeon General Inspector General of Nursing Service in the United States and in France. The committee has been instrumental in securing for nurses the benefits of the war-risk insurance law. The committee is negotiating with the Federal Board for Vocational Education for the purpose of obtaining aid for nursing education. The committee has been identified with the effort to obtain relative military rank for members of the Army Nurse Corps, producing evidence to show the need therefor. State committees on nursing have been formed by the Woman's Committee in the State Councils of Defense in 27 States. This committee regularly confers with the Red Cross Department of Nursing through its director and cooperates with the other nursing organizations. In cooperation with the two other committees on nursing of the Council (the subcommittee on public-health nursing of the Committee on Hygiene and Sani-

tation and the division of home nursing of the Committee on Labor), it has directed a special study of nursing needs in Connecticut at the request of the Public Health Council in that State.

The subcommittee on public health nursing of the Committee on Hygiene and Sanitation, cooperating with the National Organization for Public Health Nursing, has submitted a plan to manufacturers' associations and trade organizations, designed to increase the number of public health and industrial nurses to meet war-industry needs in general and to conform with the aims of the "Children's Year" program. At a conference of State child welfare chairmen of the Council of National Defense, State Councils of Defense were urged to ask universities and schools having nurses' training to provide a special four months' course for public health nursing. A leaflet on public health nursing has been written for distribution by the Federal Children's Bureau and the Woman's Committee of the Council of National Defense, in connection with Children's Year. Four lectures on venereal diseases have been completed, and assurance has been received from training schools that these will be presented to the 1918 classes. Recommendation of this subcommittee to the Red Cross Nursing Service that a superintendent of public health nursing in the extra-cantonment zones be urged, and that Miss Mary E. Lent be nominated as a qualified candidate, led to Miss Lent's appointment by Surg. Gen. Blue, of the United States Public Health Service, as a member of his staff.

RESEARCH.

The Committee on Research, in cooperation with the National Research Council, has investigated, through the laboratories available for its purposes, the vast number of medicinal preparations and appliances submitted by private individuals and firms to the Army and Navy for adoption. Every product or appliance received careful investigation, and report made to the department interested, with recommendations as to its adoption or rejection.

The work of this committee was eventually transferred to the Surgeon General's Office.

STATES ACTIVITIES.

The Committee on States Activities, with the assistance of the State and county committees, classified the medical profession according to availability for service in the Medical Reserve Corps, and those not available because of home needs. Twenty thousand physicians recommended by the State and county committees for enrollment were written to from Washington and urged to enroll, complete data as to their professional experience being tabulated,

card indexed, and classified. Monthly tabulations showing comparative percentages of enrollments in the corps in each State were regularly distributed to the State committees, with the idea of encouraging competition between the States. Energetic efforts have been made through public meetings, speaking tours, letters, and interviews to arouse interest in the Reserve Corps. Among the special methods adopted have been letters to medical graduates of 1914-1917, urging enrollment, to local medical societies suggesting methods to protect the practice of physicians called to the service, to candidates rejected for slight physical reasons urging adoption of means to correct such defects, letters of advice to physicians desiring foreign service, to physicians who could be spared from hospital staffs urging enrollment, and urging physicians who were offered commissions in the Medical Reserve Corps to accept them promptly.

Statistics have been formulated and information secured on which was based the plan for the enlistment of medical students and internes in the Enlisted Medical Reserve Corps. At a conference of State committees in Chicago in October, 1917, details as to enrollment were explained, and the conference did much to stimulate applications for commissions. It was at this meeting that the plan to organize the Volunteer Medical Service Corps was introduced. Cooperating in the work of combating venereal diseases, the committee urged the support of the State committees in legislation and medical assistance.

The State committees are represented on the State councils of defense and Red Cross State committees in order to cooperate with these organizations in their activities. In an effort to curb transmissible diseases, the committee has asked State committees to urge physicians knowing drafted men who might become a menace at a camp or post to notify the local health authorities, who would notify the senior medical officer of the camp, sending a duplicate notice to the State authorities.

SURGERY.¹

Upon the recommendation of the Committee on Surgery, the records of the members of the Medical Reserve Corps were classified according to professional and military qualifications and this information supplemented by confidential information as to ability for certain appointments in the military service. This information was transferred to code cards, one set remaining in the offices of the Council of National Defense, and two sets being forwarded to the Surgeon General's office, one of which was retained there and the other sent to Gen. Pershing's headquarters in France.

¹ NOTE.—The committee on surgery and its subcommittees have now been taken over by the Surgeon General's office.

The subcommittee on ophthalmology surveyed the ophthalmologists of the country for the purpose of requesting those available to enroll in the military service. All ophthalmologists not required for institutional and civil needs were requested to join the Medical Reserve Corps, a total of 6,075 letters being sent out. Methods of eye examinations were standardized. A conference on the reeducation of blind soldiers was held and a survey made of workshops for the blind. The committee ascertained the number of artificial eyes in stock in the country, and investigated the manufacture of glass used in binoculars, field glasses, and range finders, and optical glasses used for aviators' and ambulance drivers' goggles. Other data of considerable importance was collected by this committee, to be used in connection with reconstruction work.

The subcommittee on otology, rhinology, and laryngology requested the otolaryngologists available for military duty to join the Medical Reserve Corps. Letters to the number of 2,925 were sent out, the survey including brain, oral, and plastic surgeons. The committee aided in revising the requirements as to hearing for entrance to the Army and in the assembling of tests for malingerers. Tests of ear protectors for use in the service were made and a report submitted to the Surgeon General, who acted upon it. Special otolaryngological lectures were delivered at the cantonments, and the manuscript for a war manual of otolaryngology prepared. A card diagnostic sheet for use in cantonment base hospitals was devised. A report regarding the reconstruction of defects in hearing and speech was made to the Surgeon General's office. The committee aided in the standardizing of otolaryngological instruments and participated in the reconsideration of the instrument list for the base hospitals in camps and cantonments. The two subcommittees, acting jointly as a committee on head surgery, recommended special hospitals for the treatment of eye, ear, nose, and throat cases and prepared plans for a special hospital and dispensary building in cantonments; and it further recommended that for each group of several general hospitals there should be a head hospital, with one brain surgeon and four assistants; one chief ophthalmic surgeon with two assistants; one chief nose and throat surgeon and four assistants; and that four ophthalmic and six ear, nose, and throat surgeons be assigned to each division of the mobile forces.

VOLUNTEER MEDICAL SERVICE CORPS.

In order that the services of physicians ineligible for appointment to the Medical Reserve Corps on account of the age limit (55), physical disability, or civil or institutional needs and women physicians might be utilized by the Government, the Council of National De-

fense, upon the recommendation of the chairman of the Committee on Medicine and Sanitation, authorized and directed the committee to organize the Volunteer Medical Service Corps. A special committee to draft a plan was appointed, and on January 13, 1918, the plan presented to the General Medical Board was approved.

The Central Governing Board, in which is vested the general management of the corps, was appointed and the machinery has been set in motion to secure members, first application blanks being sent to 5,000 doctors ineligible for the Medical Reserve Corps, because of slight physical disability, and also to the members of the Senior Military Medical Association, national medical and surgical societies, and medical advisory boards. The Central Governing Board is a committee of the General Medical Board. The State governing boards consist of the State committees of the Medical Section, Council of National Defense.

The services of the members of the corps will be rendered to existing governmental agencies upon the request of the Army, Navy, Public Health Service, and American Red Cross to fill certain needs not already covered, and such other services as may be determined by the Central Governing Board of the Volunteer Medical Service Corps. The procedure for joining is simple. The applicant forwards his filled blank to the Central Governing Board in Washington and it is then referred to the proper committee for its recommendations as to the qualifications of the applicant and as to the kind of work for which he seems most fitted. A small silver badge, bearing the caduceus and the letters "V. M. S. C.," was authorized and struck, and a certificate designed.

WOMEN PHYSICIANS.

A comprehensive survey of the women physicians of the country was made by this committee. The loose-leaf census in the possession of this committee showed a total of 5,989, of which 5,788 are in active practice. The committee has registered 1,916, or 33.1 per cent. Indorsed lists of anesthetists, laboratory workers, radiographers, and sanitarians have been prepared with the assistance of experts in each line. The committee keeps in touch with the graduating classes of 57 coeducational and medical colleges for women. The committee is enlisting the interest of women physicians for service in industrial plants, keeping on file particulars as to the physicians' individual qualifications. The committee has also enlisted the interest of the women physicians in work as contract surgeons for the Army. A considerable number of women are now employed as contract surgeons in the Army.

THE WAR INDUSTRIES BOARD AND ITS SUB-ORDINATE AGENCIES.

The War Industries Board was created on July 28, 1917, by the Council, with the approval of the President, superseding the General Munitions Board of the Council, whose functions were outlined in the First Annual Report of the Council. Mr. Frank A. Scott, who had been chairman of the General Munitions Board, was retained as chairman of the new agency.

In the official announcement creating the Board its functions were defined as follows:

The Board will act as a clearing house for the war-industry needs of the Government, determine the most effective ways of meeting them, and the best means and methods of increasing production, including the creation or extension of industries demanded by the emergency, the sequence and relative urgency of the needs of the different Government services, and consider price factors and, in the first instance, the industrial and labor aspects of problems involved and the general questions affecting the purchase of commodities.

Of this Board Mr. Baruch will give his attention particularly to raw materials, Mr. Brookings to finished products, and Mr. Lovett to matters of priority. These three members, in association with Mr. Hoover so far as foodstuffs are involved, will constitute a commission to arrange purchases in accordance with the general policies formulated and approved.

The Council of National Defense and the Advisory Commission will continue unchanged and will discharge the duties imposed upon them by law. The committees heretofore created immediately subordinate to the Council of National Defense, namely, Labor, Transportation and Communication, Shipping, Medicine and Surgery, Women's Defense Work, Cooperation with State Councils, Research and Inventions, Engineering and Education, Commercial Economy, Administration and Statistics, and Inland Transportation, will continue their activities under the direction and control of the Council. Those whose work is related to the duties of the War Industries Board will cooperate with it. The subcommittees advising on particular industries and materials, both raw and finished, heretofore created, will also continue in existence and be available to furnish assistance to the War Industries Board.

The purpose of this action is to expedite the work of the Government, to furnish needed assistance to the departments engaged in making war purchases, to devolve clearly and definitely the important tasks indicated upon direct representatives of the Government not interested in commercial and industrial activities with which they will be called upon to deal, and to make clear that there is total disassociation of the industrial committees from the actual arrangement of purchases on behalf of the Government. It will lodge responsibility for effective action as definitely as is possible under existing law. It does not minimize or dispense with the splendid service which representatives of industry and labor have so unselfishly placed at the disposal of the Government.

In the new organization the War Industries Board soon took over under its jurisdiction the work of the various advisory committees on raw materials and supplies already organized under the Council and Advisory Commission, and during the late summer and fall these committees were re-formed into sections, each with a responsible chief

at its head. The Board therefore drew together under the Council the various activities which had to do particularly with war industrial needs, supplementing the work of the purchasing departments of the executive agencies of the Government.

The Board continued its activities as defined above through the fall and winter, first under the chairmanship of Mr. F. A. Scott, who resigned on account of ill health, and later under that of Mr. Daniel Willard, who resigned in January to return to his duties as president of the Baltimore & Ohio Railroad.

THE NEW ORGANIZATION.

On March 4, the President asked Mr. B. M. Baruch, a member of the Advisory Commission of the Council, to assume the duties of the chairmanship, redefining the functions of the board and the chairman as follows:

1. The creation of new facilities and the disclosing, if necessary, the opening up of new or additional sources of supply.
2. The conversion of existing facilities, where necessary, to new uses.
3. The studious conservation of resources and facilities by scientific, commercial, and industrial economies.
4. Advice to the several purchasing agencies of the Government with regard to the prices to be paid.
5. The determination, wherever necessary, of priorities of production and of delivery and of the proportions of any given article to be made immediately accessible to the several purchasing agencies when the supply of that article is insufficient, either temporarily or permanently.
6. The making of purchases for the Allies.

The board should be constituted as at present and should retain, so far as necessary and so far as consistent with the character and purposes of the reorganization, its present advisory agencies; but the ultimate decision of all questions, except the determination of prices, should rest always with the chairman, the other members acting in a cooperative and advisory capacity. The further organization of advice I will indicate below.

In the determination of priorities of production, when it is not possible to have the full supply of any article that is needed produced at once, the chairman should be assisted, and so far as practicable guided by the present priorities organization or its equivalent.

In the determination of priorities of delivery, when they must be determined, he should be assisted when necessary, in addition to the present advisory priorities organization, by the advice and cooperation of a committee constituted for the purpose and consisting of official representatives of the Food Administration, the Fuel Administration, the Railway Administration, the Shipping Board, and the War Trade Board, in order that when a priority of delivery has been determined there may be common, consistent, and concerted action to carry it into effect.

In the determination of prices the chairman should be governed by the advice of a committee consisting, besides himself, of the members of the board immediately charged with the study of raw materials and of manufactured products, of the labor member of the board, of the chairman of the

ederal Trade Commission, the chairman of the Tariff Commission, and the Fuel Administrator.

The chairman should be constantly and systematically informed of all contracts, purchases, and deliveries, in order that he may have always before him a schematized analysis of the progress of business in the several supply divisions of the Government in all departments.

The duties of the chairman are:

1. To act for the joint and several benefit of all the supply departments of the Government.
 2. To let alone what is being successfully done and interfere as little as possible with the present normal processes of purchase and delivery in the several departments.
 3. To guide and assist wherever the need for guidance or assistance may be revealed; for example, in the allocation of contracts, in obtaining access to materials in any way preempted, or in the disclosure of sources of supply.
 4. To determine what is to be done when there is any competitive or other conflict of interest between departments in the matter of supplies; for example, when there is not a sufficient immediate supply for all and there must be a decision as to priority of need or delivery, or when there is competition for the same source of manufacture or supply, or when contracts have not been placed in such a way as to get advantage of the full productive capacity of the country.
 5. To see that contracts and deliveries are followed up where such assistance is indicated under 3 and 4 above has proved to be necessary.
 6. To anticipate the prospective needs of the several supply departments of the Government and their feasible adjustment to the industry of the country as far in advance as possible, in order that as definite an outlook and opportunity for planning as possible may be afforded the business men of the country.
- In brief, he should act as the general eye of all supply departments in the field of industry.

On May 28, by action of the President, the board was formally separated from the Council to assume the functions of a separate executive agency. The scope of its activities, while still a part of the Council, is indicated by the reports of its several sections included herein.

REQUIREMENTS DIVISION.

The Requirements Division of the War Industries Board was formed as a result of the President's letter of March 4 appointing Mr. Baruch as chairman of the War Industries Board. Its general functions in the organization of the War Industries Board are best described by the official announcement of its creation, excerpts of which are given herewith.

In the words of the President's letter, the chairman of the War Industries Board "should be constantly and scientifically informed of all contracts, purchases, and deliveries in order that he may have always before him a schematized analysis of the progress of business in the several divisions of the Government in all departments."

The Requirements Division will be the agency to which this information will be furnished and to which the Supply Divisions of the purchasing departments and the Allied Purchasing Commission will "as far in advance as possible"

submit statements of their "respective needs" for raw materials and finished products. The Requirements Division will in turn delegate the task of fulfilling these needs to the Special Commodity Divisions of the War Industries Board, to the supply departments themselves, or to such other agencies as may be decided upon.

A GENERAL CLEARING HOUSE.

The statements furnished the Requirements Division by the several supply divisions of the departments will include not only commodities in which a present or threatened shortage exists, but also those in which the supply is ample, and will include commodities required by one department only, as well as commodities required by several different departments. In the procurement of supplies in which no shortage exists and where no allocation seems necessary or desirable, the Requirements Division will so advise the department presenting the requirements, which will thereupon proceed with the purchase in pursuance with their established practices. That is, in pursuance of the President's directions, the War Industries Board will "let alone what is being successfully done and will interfere as little as possible with the present normal processes of purchase and delivery in the several departments." At the same time, having complete information as to the progress of the departments, furnished through the Requirements Division, the chairman of the Board will have at his disposal complete information to guide him in the determination of general industrial policy.

Each of the commodity sections will be charged with the responsibility of collecting from the several departments of the Government, from the manufacturers and producers, and from committees representing them, and especially from the war-service committees created under the supervision of the Chamber of Commerce of the United States, and from any other reliable sources information concerning the production of the particular commodity with which the section is charged, this information to include available supplies, new sources of supply, methods to increase production, etc.

It is the purpose of the chairman of the War Industries Board to make each of the section heads the sole Government agency for dealing with the industry for which his section is responsible.

In practice the general plan of action of the organization is as follows:

The requirements division is composed of representatives of the various sections of the War Industries Board, including the priorities division, representatives of the Army, the Navy, the Emergency Fleet Corporation, the Food Administration, the Red Cross, the Railroad Administration, the Fuel Administration, and the Allied Purchasing Commission.

STATEMENTS OF "PROSPECTIVE NEEDS."

Statements of "prospective needs," as mentioned above, will be presented to the requirements division as far in advance as possible by the member or members thereof representing the agency in which the requirements originate. The requirements division will then refer specific problems to the proper commodity sections of the War Industries Board for the consideration and solution of the problem of supplying them. On each commodity section there will be representatives of each of the supply departments of the Government interested in the commodity in question.

The chief of the commodity section will study the problem referred to his section by the requirements division and will procure from all available sources, including the supply departments, information and data which will be helpful in the allocation of these requirements. At meetings of the commodity section the allocation of materials or facilities to meet the require-

ments will be determined, and in this distribution the representatives of the various supply departments of the Government who are members of the section will have full share.

CLEARANCE COMMITTEE.

The Clearance Committee was originally formed as an administrative committee of the General Munitions Board. Its functions were to prevent interference between the various supply departments of the Government in the purchase of war-making materials.

It was composed of a chairman, a secretary, and representatives from the General Staff, Navy Department, Emergency Fleet Corporation, Allied Purchasing Commission, United States Food Administration, the separate supply bureaus of the Army, and the more important sections of the General Munitions Board. The committee continued in existence when the War Industries Board was formed by the Council of National Defense and its functions continued substantially unchanged. In September, 1917, the Clearance Committee was given the following additional duties:

- (1) Adjusting matters of priority between the departments represented in the committee and making the proper recommendations with regard to such adjustments to the Priorities Division.

- (2) Informing the divisions of the War Industries Board of such items of shortage as might develop from time to time, with a view to having the divisions of the board arrange for an increased supply or, if necessary, for increased facilities.

For a number of months the Clearance Committee continued in existence exercising the functions above outlined and acting as a medium through which the war purchasing agencies of the Government might easily communicate with the War Industries Board and with each other and as a meeting ground for the war purchasing officers of the various departments of the Army, Navy, Emergency Fleet, and Allied Purchasing Commission. Lieut. Col. C. C. Bolton was chairman of the committee until May 3, 1918, when he was succeeded by Read Admiral F. F. Fletcher. At the same time there was a reorganization of the Clearance Committee, which reorganization was due chiefly to the fact that the War Department took steps leading to the coordination of purchases by organizing the Purchase and Supply Branch of the Purchase, Storage, and Traffic Division. Thereafter there was but one Army representative on the Clearance Committee. The duties of the Clearance Committee were further changed by the organization of the Requirements Division of the War Industries Board, which limited the duties of the Clearance Committee to the issuance of clearance on current and immediate purchases of commodities as distinguished from future requirements.

Instructions were issued to all Government departments that no inquiries were to be sent out or orders negotiated for articles or commodities on the Clearance List until after clearance thereon had been obtained. The Clearance List was a list of articles and commodities which were published from time to time by the Clearance Committee showing those articles in which there was an actual or imminent shortage.

PRICE FIXING COMMITTEE.

In the autumn of 1917 it was recognized that the country was facing a serious economic situation, due to the inflation of prices of various articles in which a shortage had arisen through the abnormal demands made necessary by the prosecution of the war. This situation was not peculiar to the United States. It had confronted various other nations and had been dealt with through a system of price regulation. The War Industries Board undertook to protect both the Government and the Nation from this situation and fixed maximum prices for the Government, the allies, and the public upon such fundamental commodities as steel, copper, etc.

Success immediately followed these endeavors, with the result that in his letter to Mr. Baruch, dated March 4, 1918, appointing him chairman of the War Industries Board the President outlined the formation of a special committee, whose duties should be the fixing of prices, this committee to consist of the chairman of the War Industries Board, the members of the Board immediately charged with the study of raw materials and of manufactured products, the labor member of the Board, the chairman of the Federal Trade Commission, the chairman of the Tariff Commission, the Fuel Administrator, a representative of the Army, and a representative of the Navy. The President appointed Mr. Robert S. Brookings as chairman of this committee. It held its initial meeting on March 14, 1918, and immediately commenced functioning, making its reports directly to and receiving its instructions directly from the President.

The far-reaching importance of price fixing and the rapidly increasing number of commodities over which it is absolutely necessary for the Government to assume control was immediately apparent to the members of the committee, and they forthwith proceeded to inaugurate a settled policy for the carrying out of their duties. From the first the attitude of the committee was that of a quasi-judicial body, maintaining that they held a brief neither for the purchasing interests nor for the producers involved, but were there to weigh such evidence as was presented, from which they would draw their conclusions as to fair and reasonable prices. In order intelligently to fix prices the committee felt that they should have:

- (1) The history of the industry under consideration for a period of years before the war;

- (2) Statistics of the capital invested and its relation to turnover or sales;
- (3) Sales and profits realized;
- (4) The cost of production;
- (5) A statement or balance sheet segregating the costs of the most and least efficient producers of each commodity during the year 1917; and
- (6) As much more recent information regarding cost and prevailing market prices as could be had up to the time prices are to be fixed.

METHOD OF PROCEDURE.

The machinery for furnishing this information was found in the Federal Trade Commission, which immediately became closely affiliated with the Price Fixing Committee. After a careful study of the information thus secured the committee calls into consultation the representative members of the industry involved, and endeavors by mutual agreement to determine upon maximum prices which will be fair to all concerned. In order that no injustice may be done, the committee takes exceptional care that no final decision is reached until all data available has been collected and considered. It is the endeavor of the chairman to impress upon industries the benefits which will accrue both to the producers and to the consumers by the stabilization of values and to imbue them with the idea that the Price Fixing Committee represents the Government of which they are a part and that their cooperation is necessary for the successful regulation of prices.

Owing to the frequent changes in cost growing out of war conditions, prices are usually fixed for a period of three months and meetings are called with the industry a week or two before the expiration of the period for the purpose of determining future prices. Owing to the rapidly increasing number of commodities dealt with and to the careful analysis and consideration which the gravity of the subject merits, the committee has found it necessary to be in practically continuous session since its inception.

All information, such as data supplied by the Federal Trade Commission and by the industry, as well as all testimony taken by the official stenographer at the meetings held with the industry, has been carefully compiled, bound and filed for reference. To this data is added the results of investigations made by the chairman or other members of the committee which may be of assistance to the committee in reaching its conclusions.

The chairman of the Price Fixing Committee endeavors to keep in close touch with the price-fixing policies of other nations with a view to formulating and presenting to the committee from time to time suggestions of such price-fixing policies as will best adapt themselves to the conditions in this country, and more especially with regard to trade relations with the balance of the world during the reconstruction period after the war.

Up to and including May 28 the committee had fixed prices on the following commodities: Aluminum, cement, copper, cotton linters, hides and leather, lead, Washington and Oregon fir, southern and yellow pine, New England spruce, Pennsylvania hemlock, wool, zinc, and steel.

PRIORITIES DIVISION.

The paramount purpose of priorities is the selective mobilization of the products of the soil, the mines, and the factories for direct and indirect war needs in such a way as will most effectively contribute toward winning the war.

The present organization known as the Priorities Division of the War Industries Board represents the development of the Priority Committee, a subcommittee appointed by the then General Munitions Board, under resolutions adopted on May 3 and May 14, 1917. The general functions of the committee were outlined in a communication, dated May 11, 1917, addressed by the Director of the Council of National Defense to all members of the General Munitions Board. In the letter of May 11 the following statement was made:

This committee [Priority] shall exercise full power in the determination of priority of delivery of materials and finished products whenever there is a conflict in delivery in accordance with the general policy of the Government. * * * It is further understood that at present the Priority Committee of the General Munitions Board has no power in regard to the determination of priority in regard to civilian needs in which the Army and Navy requirements are not involved. * * * It is further understood that as between the needs of the allies and our civilian population the Priority Committee of the General Munitions Board for the present has no authority to act. In this connection, however, the Priority Committee should keep full information as to such cases or instances as come to its attention in order that plans may further be developed for properly handling the matter.

Under the resolution of May 14 Maj. Gen. James B. Aleshire was chosen to organize the Priority Committee. In the first annual report of the Council of National Defense for the fiscal year ending June 30, 1917, Gen. Aleshire is designated as chairman and sole member of the Priority Committee.

Prior to the establishment of the Priority Committee the General Munitions Board had been besieged with requests for information from manufacturers, contractors, and others dealing with Government contracts with reference to matters of precedence and preference. These communications were, as a rule, referred to the various subcommittees specializing in different commercial lines. After the appointment of Gen. Aleshire such requests were referred to the Priority Committee.

In order to care for the increasing volume of work the personnel of the committee was soon greatly enlarged. Brief meetings of the committee were held two or three times a week and weekly reports

were rendered to the General Munitions Board. The committee lacked power to bind the manufacturers and others to any instructions issued by them; the activities of the committee were largely confined to requests for patriotic cooperation. It may be said that these appeals seldom failed and nearly every case of conflicting deliveries was settled in a manner satisfactory to all concerned. By the end of July the appeals to the committee averaged between 80 and 100 per day.

The creation of the War Industries Board under the Council of National Defense in July, 1917, and the appointment of Judge Robert S. Lovett as member in charge of priorities brought with it the second stage in the history of the priorities organization. The old committee was limited to working in an informal way to secure priority for important war work. While its efforts were generally successful it was recognized that the time had come to attack the problem in a more vigorous way and to secure sufficient power to insure the obtaining of priority for all work directly or indirectly necessary for the prosecution of the war.

Judge Lovett enlisted the services of Mr. George Armsby, of San Francisco, and of Judge Edwin B. Parker, of Houston. Judge Parker took over the active work of organization of the new "Priorities Committee" and the preparation of circulars No. 1 and No. 2, outlining the activities of the committee. These circulars were issued with the signed approval of Hon. Newton D. Baker as chairman of the Council of National Defense and as Secretary of War, and of Hon. Josephus Daniels as Secretary of the Navy.

EXPANSION OF ACTIVITIES.

At first the need for action by the committee appeared to be largely centered about the distribution of iron and steel and iron and steel products. Gradually, however, it became apparent that the need for supervision of production applied to various other industries in which the supply became less than the demand. The activities of the committee were accordingly extended to such other commodities. The public had been accustomed to purchase priority in order to secure prompt delivery and hence the unusual demand created by abnormal war conditions resulted in abnormal and unusual prices, having no relation to the cost of production plus a reasonable profit. The public accordingly began to understand that it could no longer purchase priority, but that priority in production and distribution was accorded by a wholly disinterested Government agency tested solely by the public interest. This to a large extent naturally removed the incentive for the payment of a premium for precedence in production and delivery, and thus was of distinct influence in holding prices to a normal level. The public likewise began to realize

that the "selective mobilization of the products of the soil, mines, and factories for direct and indirect war needs in such a way as would most effectively contribute toward winning the war" necessarily involves the relegation to the bottom of the waiting list of all projects and undertakings which do not directly or indirectly so contribute.

Circulars No. 1 and No. 2 provided for the issuance of priority certificates which classified orders in accordance with their relative importance in war work or other work of exceptional or national importance. Class A certificates were given to cover direct war work of the United States or the allies. Class B certificates were granted to cover orders and work which, while not primarily designed for the prosecution of the war, yet were of public interest and essential to the national welfare, or otherwise of exceptional importance. Precedence in production was accorded by the manufacturers in accordance with the ratings given, class A having precedence over class B, class A-1 having precedence over class A-2, and so on. On January 1, 1918, Circular No. 3 was issued, explaining in detail the extended functions of the Priorities Committee.

COOPERATION WITH OTHER AGENCIES.

The Priorities Committee has constantly worked in close touch with other agencies of the Government and of the various industries, and has in turn received their closest cooperation and constant helpful suggestions and recommendations. Thus, the former free use of the commandeering power by the Army, the Navy, and the Emergency Fleet Corporation which resulted in frequent serious conflicts between these departments and sometimes delayed a program of greater importance for one of lesser import was, by understanding with the Secretary of War, the Secretary of the Navy, and the president of the Emergency Fleet Corporation, limited by submitting contemplated commandeering orders to the Priorities Commissioner. This resulted in eliminating conflicts and frequently allowed the satisfaction of the requirements of all departments without the necessity for the use of the more involved and drastic commandeering procedure. Thus, also, by agreement of the Secretary of War and the Secretary of the Navy, it was provided that penalties would not be collected from a company failing to make deliveries under the conditions of its contract where it was clearly established that such failure was due to the observance of priority certificates issued by the Priorities Committee. Similar instances of cooperation are numerous.

Not only, however, has the Priorities Committee directed its efforts toward the fulfillment of the military and shipbuilding program but it has likewise acted on the recommendations of the Food

Administration, the Fuel Administration, the Railroad Administration, and other agencies of the Government in securing proper precedence in delivery of materials, equipment, and supplies necessary for the development of various projects or industries indirectly required for the prosecution of the war or otherwise of public interest and essential to the national welfare.

The members of the committee have specialized on purposes rather than on commodities and thus became thoroughly familiar with the requirements necessary for the accomplishment of the specific purposes assigned. Expert information as to the commodity desired is obtained by conference with representatives of the War Industries Board specializing on the commodity or by conference with representatives of the industry manufacturing the commodity. A close coordination between the activities of the different members of the committee is obtained by daily meetings of the committee and by constant conferences on matters of more than usual import.

PRIORITIES BOARD.

In the letter of March 4 from the President of the United States by which Mr. B. M. Baruch was appointed chairman of the War Industries Board to succeed Mr. Daniel Willard, the determination of priorities of production and delivery and of the proportions of any given article to be made immediately accessible to the several purchasing agencies when the supply of that article is insufficient, either temporarily or permanently, is stated as the fifth of the six functions of the War Industries Board. The letter further states, with reference to the duties of the chairman of the War Industries Board:

In the determination of priorities of production, when it is not possible to have the full supply of any article that is needed produced at once, the chairman should be assisted, and so far as practicable guided, by the present priorities organization or its equivalent.

In the determination of priorities of delivery, when they must be determined, he should be assisted when necessary, in addition to the present advisory priorities organization, by the advice and cooperation of a committee constituted for the purpose and consisting of official representatives of the Food Administration, the Fuel Administration, the Railway Administration, the Shipping Board, and the War Trade Board, in order that when a priority of delivery has been determined, there may be common, consistent, and concerted action to carry it into effect.

In accordance with this letter the Priorities Board was formed for the determination of priorities in delivery, and the first meeting was held on March 19, 1918.

Among the functions of the board is the coordination of the activities of all governmental agencies so far as pertains to the production and distribution of materials, equipment, or supplies for war needs,

direct and indirect; the formation and promulgation of priority rules and regulations for the guidance of transportation authorities; the consideration and determination of the relative urgency for transportation of fuel, food, other raw materials, and manufactured products; and of materials, equipments, and supplies required in production; to the end that the industrial program, as a whole, may not be thrown out of balance, but that the production program, the inland transportation program, the program affecting imports and exports, and the over-seas transportation of military supplies may be coordinated, and underproduction, over production, or congestion (as far as practicable), avoided.

Preference lists are issued from time to time for the guidance of all governmental agencies and all others interested in (1) the production and supply of fuel and electric energy, (2) the supply of labor, (3) the supply of transportation service by rail, water, pipe lines, or otherwise in so far as such service contributes to the production of finished products. Preference List No. 1, covering the supply and distribution of coal and coke was issued April 6, 1918. Representatives of the board confer with committees of various industries in order to determine the extent to which such industries are entitled to priority assistance.

ALLIED PURCHASING COMMISSION.

The President of the United States, in a meeting with the War Industries Board held August 6, 1917, stated that "the Allies should receive the same prices on military materials which this country paid for its military requirements, provided, of course, that reciprocal action on the part of the Allies, not only toward this country but toward each other, was arranged for."

In August, 1917, the United States Government, through the Secretary of the Treasury, entered into arrangements with the governments of Great Britain, France, Italy, Belgium, Serbia, and Russia regarding the purchases of supplies for those governments in the United States, and Bernard M. Baruch, Robert S. Lovett, and Robert S. Brookings were designated a commission through whom or with whose approval or consent all purchases in the United States of materials and supplies by or on behalf of these Governments should be made. All of these arrangements are identical and all are now in force, except the one with Russia, but with important changes, as follows: On March 4, 1918, the President, in a letter to Mr. Baruch outlining the functions of the War Industries Board, included as one of them "The making of purchases for the Allies." Since this date, therefore, the Purchasing Commission has been a part or branch

of the War Industries Board, and through this board is responsible to the Treasury Department.

On August 27, 1917, the Purchasing Commission met and outlined certain policies. It was agreed that Mr. Alexander Legge should be appointed as a general representative of the commission, with the title of "business manager," and as such should be authorized to consent in writing on behalf of the Purchasing Commission to any of the purchases contemplated by the agreements entered into, provided the prices should have been specified by the commission or by the member of the commission authorized by it to determine the prices of such articles or commodities; and should conduct the correspondence of and generally act as a representative of the commission; subject, however, to such limitations and directions as the commission might from time to time prescribe. On May 1, 1918, Mr. Legge was succeeded as business manager of the commission by Mr. James A. Carr.

NATURE OF FUNCTIONS.

It is the duty of the commission to use its best efforts to obtain offers of the materials and supplies shown to be required, at the best obtainable prices and terms, of delivery and otherwise, and to submit the same to the accredited representatives of the several allied governments, but it is not a part of the duty of the commission to prepare and sign contracts, or to supervise their execution, or to determine technical details, or to carry out the inspection of materials, all of which matters are the concern of the allied governments. Through an arrangement with the War Trade Board the commission, during the last few months of the year, has handled applications for articles and commodities which are on the conserved list and are for use by nationals abroad, in the same manner in which applications for goods for Government use are taken care of. The commission has the cooperation of division heads and commodity chiefs of the War Industries Board in carrying on its duties. There is an agreement that during the continuance of this arrangement none of the allied governments shall make purchases in the United States otherwise than through or with the approval or consent of the purchasing commission.

Meetings are held on Tuesdays and Thursdays of each week in the office of the business manager and are attended by representatives of the several allied governments and presided over by the business manager of the commission. The more important matters pertaining to the duties of the commission are given the necessary attention and each representative afforded an opportunity to discuss matters of production, price, and movement of articles or commodities required

by his Government. Not infrequently these meetings are attended by one or more commodity chiefs, and especially in case there has been unusual delay in filling orders.

The commission determines its own organization and rules and methods of procedure, and employs clerical assistance, all subject to the approval of the chairman of the War Industries Board and, through him, to the Secretary of the Treasury. The expenses of the commission are prorated amongst the several allied governments in proportion to applications filed for purchases through the commission. The commission is under no liability except in good faith to use its best efforts as above stated. Minutes of the meetings are kept in the office of the business manager, and such books, records and reports, daily and periodical, as are considered necessary and advisable are kept in the general office of the commission and have been established and carried on in cooperation with the Treasury Department and in accord with the wishes and instructions of representatives of the United States Treasury, to whom are also sent originals or copies of certain reports and statements originating in the offices of the various allied government commissions or sections of the War Industries Board or Food Administration which are received from these sources from time to time.

LABOR DIVISION.

Mr. Hugh Frayne is chairman of this division. All matters affecting labor coming before the War Industries Board or any of its divisions or sections are referred to him for consideration. The chairman of the Labor Division is a member of the Price-Fixing Committee, representing the War Industries Board; also a member of the War Labor Policies Board, which body deals with the national policies of the Government affecting labor conditions generally.

Mr. Frayne is also chairman of the United States War Badge Committee. This committee was appointed by the chairman of the War Labor Policies Board and is composed of representatives from the following departments: The War Department, the Navy Department, the Department of Labor, the United States Shipping Board, the War Industries Board, the Committee on Public Information. This committee has worked out a comprehensive plan for the National War Industries Badge, and the Secretary of Labor has appointed a director in charge of same, the committee to act as an advisory board to him.

The chairman is further in constant touch with the Department of Labor through its various bureaus, principally the Mediation and Conciliation, the United States Employment Service, and the Women in Industry Service, and works in full cooperation with

them. This division is functioning with every governmental department dealing with labor. This relationship with other Government agencies has proved highly valuable, as there are many important labor matters coming to the chairman direct or through the War Industries Board or its departments that would not otherwise reach these agencies.

The chairman is in daily contact with the officers of the American Federation of Labor and the general officers and representatives of the various unions whose members are employed in war industries, and in this way has been able to reach adjustments in disputes as well as to advise with them upon all matters affecting labor generally.

This work has not been confined alone to workers. The chairman has assisted in many ways employers of all kinds in securing needed help and in the adjustment of grievances or complaints.

A section of the Labor Division has been organized by the chairman, known as the War Prison Labor and National Waste Reclamation Section. The work of this section has been along the following lines:

1. Securing cooperation of Government departments and organizations in the reclamation of man power and waste material.
2. Utilization of the labor of prisoners, war, civil, and disciplinary, in this work.
3. Reeducation by vocational training of crippled soldiers, sailors, and those injured in industry to the end that they may become self-sustaining and independent.
4. National waste reclamation system, with the country as the unit.
5. Standardization of industries and occupations in penal institutions for producing materials.
6. National road work system for prisoners.
7. Development of war-prisoners' division in Army.
8. Induction into industry and agriculture of discharged or paroled prisoners.
9. Army and Navy waste reclamation.
10. Development of camp gardens.
11. Aiding in work of securing legislation to make this work permanent.

The effectiveness of the work of this section in connection with the reclamation work is best shown in the success which is being obtained through the Reclamation Division of the Quartermaster Department, with which the section is in full and active cooperation.

CONSERVATION DIVISION.

The Conservation Division was organized on May 9. The history of the work of the Commercial Economy Board of the Council of National Defense, whose functions were assumed by the Conservation Division, will be found in a later section of this report.

STEEL DIVISION.

(Office of the Director of Steel Supply.)

The office was created in October, 1917, for the purpose of regulating production and distribution of iron and steel products, drawing together and developing further preliminary work which had been accomplished by the chairman and individual members of the Committee on Raw Materials. This became necessary in view of the tremendous demands of the United States Government and the Allies for steel.

All requisitions for steel for war purposes have been distributed to the various manufacturers through this office in accordance with their ability to produce, thereby effecting an equitable distribution and placing the orders with the mills best suited to deliver within the time required. All steel-producing companies are required to furnish a weekly report of orders received, shipments, and unfilled tonnage to Army, Navy, Emergency Fleet, other United States Government agencies, domestic non-Government agencies, and to each of the Allies. By these reports it is possible to see the exact condition at each mill on each product for the various governmental departments and the Allies, and in the distribution of new orders the condition of the mills as shown by these reports is the basis for allocations.

When the office of the Director of Steel Supply was created only a very small amount of the steel being produced was used for war purposes, and it was confronted with a great task of converting the manufacturers over to producing steel for war necessities, including immense tonnages of shell steel, ship plates, structural steel, rails, etc. As it soon became apparent that certain products of iron and steel were produced in excess of that required for war purposes, while of others there was a great shortage, new facilities had to be created for shell steel, plates, and the raw steel supply needed to operate the new facilities created for these products taken away from finished steel commodities not required for war purposes. All of this was naturally very gradual. The office was confronted by many obstacles, principally including the matters of transportation and supply of coal and coke during last fall and winter, at which time the production of steel was not averaging more than 50 to 60 per cent of capacity.

In view of the limited output, it became very necessary that such steel as was produced by each of the manufacturers be placed with the governmental departments or Allies where it would do the most good in the prosecution of the war. This received very close attention, and each mill was constantly advised as to what products to make and the sequence of shipment governed by priority ratings as issued by the Priorities Division of the War Industries Board.

DEALING WITH CIVILIAN REQUIREMENTS.

Not only did the Steel Division have to supply direct war needs, but it was confronted also with increased building facilities in the United States for the manufacture of munitions and other governmental supplies. The Railroad Administration, further, required a very large number of cars and locomotives to meet the increased demands of transportation. In addition to bringing about concerted action and concentration on certain products, the office of the Director of Steel Supply, in conjunction with other divisions of the War Industries Board and the Council of National Defense, restricted the use of steel in certain industries, and the steel thus saved by these restrictions of operations in industries less essential was diverted to governmental needs. The most prominent example would be in plates which were needed for shipbuilding purposes. The Emergency Fleet Corporation, as well as the Allies, had arranged a very extensive program in shipbuilding, and at the time plate production had never exceeded 4,000,000 tons per year. It soon became apparent, to meet the shipbuilding program as well as the car and locomotive requirements, that at least 6,000,000 tons of plates would be required per year. Through efforts as mentioned above the production of plates has been increased to this rate. This example is only indicative of many other similar cases of shell steel, rails, etc.

The Steel Division, through the Pig Iron Department, has been in daily touch with the Fuel Administration, and by concerted action has been successful in arranging satisfactory supplies of coal and coke, which were limiting factors during the fall of 1917 and the winter months of 1918. After the problem of transportation and coke was solved, it was then resolved into a matter of distribution, directing the efforts of the mills to first take care of the urgent war necessities. This has been accomplished successfully, and as far as has been determined, no department of the Government nor the allies have suffered for steel on any important war program. The manufacturers of iron and steel have given their best cooperation to this office at all times, and nothing but praise can be offered to the committee of iron and steel manufacturers for the great efforts they have made in meeting the Government demands. They have always operated in accordance with instructions, and have set aside all personal business interests to meet the Government demands.

About the time the office of Steel Director was created, it became evident that prices must be controlled, as the scarcity of iron and steel was so acute that almost any price would be paid to secure tonnage. Therefore, through the War Industries Board, with the approval of the President, prices were regulated from time to time, and were fixed on a basis that was fair to both manufacturer and the Government. In many products the reduction in

prices amounted to 75 per cent; for example, plates were selling from 8 to 14 cents per pound, and the Government price was fixed at $3\frac{1}{4}$ cents per pound. This price fixing resulted in a saving to the public, the Government and the allies unquestionably of hundreds of millions of dollars, based on prices in effect prior to the creation of the office of Director of Steel Supply.

TIN SECTION.

A close supervision over the importation, distribution, production, and consumption of tin is the chief function of the Tin Section. From its many activities the following are presented as giving a good general idea of the work being accomplished by the Tin Section:

Investigations have been made regarding the possibilities of increasing domestic production, and the promotion of smelting of tin in the United States has been effected through giving assistance in securing materials for construction and enlargement of smelters, and, in conjunction with the Shipping Board, in getting space for shipments of tin ore to this country.

In order to effect economies in the use of tin, the Tin Section has been in communication with many hundreds of users of tin, and has had numerous conferences with committees representing tin-consuming industries, these committees having been formed at the request of the Tin Section. Considerable saving has already been effected, and the best estimates indicate that consumption will probably be cut down by at least 10 or 15 per cent.

Through conferences and correspondence with various Government departments issuing specifications requiring the use of tin, wasteful and unnecessary practices are being eliminated. Hearty cooperation has been received from the Government departments concerned.

A special committee has been formed by the Tin Section to consider all matters pertaining to the production and consumption of tin plate, the tin-plate industry being the largest individual consumer of tin.

The Tin Section, through the subcommittee on pig tin of the American Iron and Steel Institute, secures information as to parties who may have tin to spare and thereby enables needy users to make arrangements for purchase to meet their requirements.

In several instances the Tin Section has assisted in securing considerable quantities of tin for the Army and Navy, through the subcommittee on pig tin, at very favorable prices.

In cooperation with the War Trade Board and the subcommittee on pig tin of the American Iron and Steel Institute, a check has been placed upon irregular practices in connection with the importation of tin, and the services of the Tin Section have been at the disposal

of deserving consumers of tin in their efforts to procure the necessary export permits from the Rubber and Tin Exports Committee in London, which controls the exports of tin from all British possessions.

The Tin Section has gathered complete sets of statistical information on tin, tin ore, and tin plate, their production, consumption, stocks, prices, etc., so far as this information is necessary for carrying on the business of the section.

NONFERROUS METALS SECTION.

At the beginning of the year under consideration the section was in charge of Mr. Eugene Meyer, jr. During his incumbency various metals and minerals not handled by this section now were included under it, such as Portland cement, mica, and abrasives. Since March, 1918, Mr. Pope Yeatman has been head of the section.

Aluminum, antimony, copper, lead, nickel, quicksilver, and zinc are the metals handled now. The functions of the section are to encourage production when necessary and provide for the requirements in these metals of the United States Government, the allied governments, and the essential commercial needs of the country. It is the aim to interfere as little as possible with the normal course of business and to help all producers, importers, middlemen, and consumers in their difficulties. The conditions in each of these metal industries will be considered separately.

ALUMINUM.

There is only one producer of virgin aluminum in the United States. According to the requirements reported by the various purchasing departments of our own and the allied governments, the average monthly requirements during the balance of this year are just under 10,000,000 pounds. It is probable that all the indirect requirements of the Government are not reported, but, including these, the section estimates that from 85 to 90 per cent of the supply is required for war purposes, the allocation of which has been in charge of the section. The allied governments are taking about one-fifth of the production.

The section assisted the Price Fixing Committee with reference to the fixing of the price of aluminum, which was done by an agreement with the producers made in March, 1918.

ANTIMONY.

Domestic production has been practically negligible, and almost our entire supply comes from importations from Mexico and China, importations from England and Bolivia being now cut off. The ore deposits in this country are of such low grade that only a very large increase in the price would make it possible for them to be operated

at a profit. Some ore is imported from Mexico and reduced in this country. There are large stocks in bonded warehouses, approximating 10,000,000 pounds, and importers of metal to-day realize that if the price goes up a few cents per pound more a considerable amount of this bonded antimony might be released.

Market quotations on price are not very reliable, as they chiefly refer to sales of small lots. Arrangements were made by the section for the purchases early in May at 12½ cents per pound on behalf of the Ordnance Department and in June at 11.9 cents per pound.

COPPER.

The total requirements for war purposes, direct and indirect, of our own and the allied governments absorb in excess of 90 per cent of the supply of new copper. The use of copper for nonessential purposes has been materially curtailed, and the demands of the manufacturers are carefully scrutinized.

A Copper Producers' Committee has been formed, representing the leading producers in the country, to allocate to the various producers the direct requirements of the Government and to record the quantities going to private manufacturers on domestic and foreign contracts, which include the indirect requirements of our own and the allied governments.

In order to take care of and stabilize the trade in small quantities, the Copper Producers' Committee has designated certain responsible jobbers in various parts of the country to whom they consign copper when it becomes necessary to prevent scarcity. A jobbing differential of 5 per cent is allowed.

This section cooperated in the fixing of the price of copper, which was done by an agreement between the War Industries Board and the producers approved by the President September 21, 1917. The price of 23 cents per pound fixed at that time was still in effect at the date of this report.

LEAD.

In a manner similar to copper, the lead requirements of the United States Government are allocated by the Lead Producers' Committee. No price has been fixed by the Price-Fixing Committee, but the lead producers have agreed to supply the United States Government's needs at the average Engineering and Mining Journal quotation for pig lead at East St. Louis for the month of shipment, with a guaranty that the price shall be no greater than the New York average price less a certain differential dependent upon freight rates. This agreement has been in force since November, 1917, in four-month periods.

Until recently the supply was more than ample to take care of the demands, not only for war purposes but for commercial purposes as

well; of late, however, the stocks have materially diminished, so that it has become necessary to look into the character of the commercial requirements with a view to cutting off those that are non-essential in case of necessity.

The section has endeavored to see that the allied governments' needs are filled so far as possible from lead refined in bond from imported ores and bullion, but when bonded lead has not been available assistance has been given them in purchasing domestic lead.

The antimonial lead requirements of the United States Government, used mainly in shrapnel balls, are obtained by absorbing all antimonial lead production from domestic ores and to that extent avoiding the necessity of importing the antimony metal to mix with pig lead.

NICKEL.

Nearly the entire production of nickel in the United States is made by one corporation, which imports ore and matte from Canada. Monel metal, which is about two-thirds nickel and one-third copper, is produced directly from the ore and is used to a considerable extent by the Navy. The war requirements amount to about 90 per cent of the total production.

The section has had applications for nickel for coinage purposes but has taken the position that this is a nonessential use.

QUICKSILVER.

This metal is produced in satisfactory quantities by mines in California, Texas, and a few other States. Most of them are small, but all have shown a patriotic desire to cooperate.

A meeting was held on the 19th of March with the producers, agents, and consumers, at which general conditions were discussed. Other meetings were held on April 1 with the producers and on April 25 with the importers, at which it was agreed that the requirements of the United States Government, amounting approximately to 40 per cent of the production, would be supplied by the mines in proportion to their output and by 40 per cent of the imports.

The Ordnance and Signal Corps of the Army have agreed to purchase their supplies through the Navy Department, which contracts directly with the producers and importers after collaboration with this section. This is a satisfactory arrangement and obviates the necessity of any producers' committee for allocation.

ZINC.

The position in zinc has been quite different from that of the other metals. A year ago the price was decreasing from the high levels that had been attained a year earlier, due to the largely increased equipment made to meet the demands of the allied governments in

the earlier years of the war, the output from which was beginning to swamp the market and increase the stocks. As the price decreased some of the smelters shut down, so that the active smelting capacity to-day is less than a year ago, but nevertheless the supply continues considerably in excess of the demand for all purposes, including nonessential commercial uses.

This section has endeavored to find uses for zinc in substitution for other metals which are scarce, such as tin, and to encourage the increased production of grade A spelter as well as that of sheet and plate zinc, because grade A is used for high-grade brass for war purposes, and the sheet-zinc capacity of the country was rather low. The Army agreed to accept as grade A a less stringent specification than the Navy, and Army grade A can be and now is being made by redistillation from ordinary spelter. Sheet zinc can be substituted for many uses for galvanized iron, tin plate, and sheet aluminum. Another method adopted to encourage the zinc producers was to influence both the Army and the Navy to anticipate their requirements in spelter by making large purchases. This was desirable from their standpoint, also, as a form of insurance against possible shortage should transportation difficulties develop again this coming winter.

The Zinc Committee which was in existence a year ago has been discontinued. Recently the American Zinc Institute was formed, which will doubtless serve to facilitate negotiations with members of the industry.

The section cooperated in the fixing of zinc prices by the War Industries Board, an agreement with the industry being made on February 14, 1918.

CHEMICALS AND EXPLOSIVES DIVISION.

Up to November, 1917, the Chemicals Committee of the Council of National Defense, under the chairmanship of Dr. William H. Nichols, gave contact between the Board and the various manufacturers of chemicals. About November 1, when this Committee was dissolved, along with other advisory committees, it became necessary for the Board to organize for a more direct handling of chemical matters, and the Chemicals and Explosives Section (subsequently called the Chemicals and Explosives Division) was organized under the general supervision of Mr. L. L. Summers, with Mr. Charles H. MacDowell in charge of chemicals. Up to this time Mr. Summers, cooperating with Mr. Marsh F. Chase and others, had been working on new production of explosives, chemicals, nitrogen fixation, etc. Mr. MacDowell was handling nitrates, general chemicals, and raw materials entering into explosives, Dr. Marston T. Bogert, asso-

ciated with Dr. S. A. Tucker and Dr. Herbert R. Moody, acting as technical advisers to the section.

In November the production of wood-distillation plants was taken over and the products allocated. Arrangements were also perfected for the commandeering and distribution of all platinum imports and stocks in hands of refiners.

On December 10 arrangements were consummated for the international handling of nitrate of soda with a nitrate executive in London. This plan is further described in the report of the Nitrates Section.

About the first of the year it became necessary materially to enlarge the personnel of the Chemicals and Explosives Division. This was done through securing the services of experts intrusted with the handling of certain groups of commodities, a number of new sections being formed with these experts in charge.

In February steps were taken to increase the production of chlorine for the manufacture of toxic acid. On March 1, 1918, the production of toluol at all plants was commandeered by the Government and allocation of the product arranged for through this division in cooperation with the interested departments.

Due to the great increase in the production of sulphuric acid and the need for development and control of brimstone and sulphur-bearing ores for its manufacture, the control and distribution of this product was authorized and put into effect.

Arrangements have also been made for the distribution of manganese, chrome, tungsten, and other ferro alloys; for the distribution of imported tanning materials, and the stimulation in production of domestic extracts, carbon and graphite electrodes, abrasives, both natural and artificial, refractories, artificial and vegetable dyes, fine chemicals, phosphorus, paints and pigments, asbestos and magnesia insulation, chemical glass and stone ware, sulphuric, nitric, muriatic, and other acids, heavy chemicals, etc. These commodities are handled through commodity sections each headed by a chief, the membership of the section being made up of coordinating members from the Army, Navy, Emergency Fleet Corporation, Fuel Administration, Food Administration, and other interested departments.

Prices on acids have been fixed through the Price-Fixing Committee.

Technical and scientific questions are handled by the Technical Section, composed of Dr. E. R. Weidlein, acting director of the Mellon Institute of Industrial and Physical Research; Dr. Herbert R. Moody, professor of chemistry, College of the City of New York; and Dr. Thomas P. McCutcheon, assistant professor of chemistry, University of Pennsylvania. These gentlemen keep in close touch with various industries, research laboratories, and with the National

Research Council, and instigate such research and investigation as is found necessary in carrying on the work of the Chemicals and Explosives Division.

EXPLOSIVES SECTION.

The work of the Explosives Section of the War Industries Board for the last year has consisted largely in assisting the War and Navy Departments and the Allied Purchasing Commission in placing explosives contracts and in providing for the additional plants necessary to produce the quantity of explosives required.

During the fall of 1917 the section was active in developing additional high explosives through the production of ammonium nitrate. As a result of the cooperative work between the War Industries Board and the War Department the present Muscle Shoals plant was started. After this, through the activities of the War Industries Board, arrangements were perfected whereby two large smokeless-powder plants were built directly by the Government. Both of these plants have been started and are rapidly getting into full production.

At the beginning of the year a great many of the privately owned plants were only working part capacity due to lack of complete plant facilities. A large amount of work was done by the Section in bringing about conditions whereby these plants could be operated more efficiently and to greater capacity.

The Explosives Section has also extensively investigated yields and, through the thorough cooperation of the industry, materially reduced amounts of raw materials are now used in the manufacturing processes, and, in a number of cases, through their efforts technical information has been given by one company to another with the result in every case of a saving of both raw materials and of money to the Government.

One of the most important matters resulting directly from the efforts of the Section was the arrangement of a very material increase in picric-acid production by the United States Government for the account of the Allies. As a result of these negotiations conducted by the board on behalf of the Allies, the United States Government has undertaken the erection of three large picric plants, together with arrangements for the manufacture in other plants of the phenol and acid required. The section also assisted in the establishment of plants for the manufacture of T. N. A. and T. N. X., neither of which had been manufactured in this country.

ACIDS AND HEAVY CHEMICALS SECTION.

The Acids and Heavy Chemicals Section was organized in April, 1918, with Mr. A. R. Brunner as Chief. Information with regard to production has been obtained from a survey made by the Bureau of

Mines, and with regard to costs from a survey made by the Federal Trade Commission.

Numerous meetings have been held with users of acids for less essential purposes, looking toward a conservation of acid supplies, and especially to a decrease in the use of nitrate of soda and to the conservation of sulphuric acid by the substitution, wherever possible, of nitre cake.

ALKALI AND CHLORINE SECTION.

The Alkali and Chlorine Section was initiated on April 15, 1918. Previous to that time the commodities now handled by the section were under the direction of Mr. C. H. MacDowell, of the Chemicals and Explosives Division, and Mr. J. D. Pennock, chairman Alkali Section, Chemical Alliance. The activities of the section embrace the following commodities:

Alkalies.—Caustic soda, soda ash, bicarbonate of soda, potash, and chemical lime.

Chlorine and chlorine compounds.—Liquid chlorine, bleaching powder, carbon tetrachloride, monochlorobenzol, dichlorobenzol, tin tetrachloride, sulphur monochloride, and other chlorine products essential to the war program.

CAUSTIC SODA.

Immediately after the organization of the section it was found that a shortage of caustic soda was threatened by reason of the increased military requirements and the stimulation of civil industries, the greater part of whose production ultimately finds some essential destination in the conduct of the war.

With the cooperation of this section the regulations existing at that time governing the export of caustic soda were amended and the practice so modified that only essential requirements of the Allies and neutrals were allowed export licenses. The actual amount of caustic soda exported thereafter amounted to only about one-third of the quantity which had been estimated as available for export.

The trade was duly advised of the existing conditions and efforts were made to stimulate the production of caustic soda with the existing facilities. Plans and definite recommendations were made to increase the producing capacity of the country. By means of conservation in the less essential industries and increase in the output, the section believes that the shortage on caustic soda will be reduced to zero early in 1919.

This section is engaged in the allocation of caustic soda on Government contracts and on indirect Government work, where conditions require or warrant it. The closest cooperation has been maintained between various Government supply departments, the War Industries Board, and the manufacturers.

SODA ASH.

While there has not yet developed an actual shortage of soda ash, the requirements of the country easily take all that can be produced, and shipments are less prompt than in peace times. The production of the country has been greatly increased since 1914, and it is believed that there is now an ample supply for war requirements, even if such requirements should be largely increased. Such increased demand could be met by sharp curtailment of the use of soda ash in the less essential industries. Plans are already made in case such an exigency should develop and could promptly be put into effect.

The direct Government requirements for soda ash and many of the indirect requirements are allocated through this section.

POTASH.

Military requirements for potash are small and there is an ample supply of this commodity to meet this demand. Various departments of the Government are promoting the development of the potash resources of the country to meet the large agricultural demands for this essential element. The section is cooperating with the other departments interested.

CHLORINE AND CHLORINE COMPOUNDS.

Early in the spring the increasing needs for war purposes for chlorine and many of the compounds thereof indicated that a close surveillance of the industry would soon become necessary. Plans were accordingly made for the control of the distribution of chlorine products by this section, but these plans had not been put into effect at the date of this report.

CHEMICAL GLASS AND STONEWARE SECTION.

This section was started April 6, 1918. It has endeavored to secure, by consulting all available records and by direct survey of the trades, statistical data in regard to its commodities to establish total production and future possibilities, total Government requirements and estimated future needs, total Allied requirements and estimated future needs, total civilian requirements and estimated future needs, and total stocks on hand. Steps have been taken to increase production where circumstances demanded it, and manufacturers have been assisted in securing cars, fuel, and material in order to carry out their contracts.

The following commodities have been handled:

Chemical Glass.—Glass used in the production of acids, consisting of glass sleeves, bends, cylinders, tubes, storage, and vessels used in

laboratories. The condition of the industry proved in general satisfactory.

Glass Carboys (12-Gallon).—These are the containers for nitric, sulphuric, and other acids. Production was not equal to the demand. Steps have been taken to take care of the shortage, and at the time of this report it was felt that the situation was fairly satisfactory.

Chemical Stoneware.—Embracing vitrious acid-proof brick, packing for acid towers, stoneware pipe fittings, rings, flanges, jars, tanks, in fact, all acid-proof material such as used in the production of acids, alkalis, and chemicals. Factories in general were running in full. Orders were being handled satisfactorily. The section has acted in an advisory capacity with the Railway and Fuel Administrations in order to assist them in determining priorities.

Asbestos and Magnesia.—These products have so many uses that it is almost impossible to enumerate them. Broadly speaking, the chief uses are for insulating braids and cloth, fireproofing, filtration, pipe covering, and packing. Complete survey had not been made, but it was under way. The condition of this industry was not causing any great concern outside of its difficulty in securing sufficient coal and labor.

COAL GAS PRODUCTS SECTION.

This section handles toluol, benzol, xylol, phenol, solvent, naphtha, road oil, asphaltum, acetylene, nitrogen, calcium carbide, rare gases, saccharin, hydrogen, and oxygen.

Toluol is the basis of the high explosive T. N. T. used in drop bombs, depth charges, submarine torpedoes, "Jack Johnsons," and practically all high-explosive work. Owing to the violence of this explosive, T. N. T. has rather limited uses for nonmilitary purposes.

At the outbreak of the war in 1914 the price of toluol was from 18 to 22 cents per gallon, and the production of the country was some 500,000 gallons per year, practically all of which was used in the manufacture of saccharin, dyes, benzoates, drugs, etc. With the war there came a demand for T. N. T., and the price of toluol advanced to some \$6 per gallon. At 20 cents per gallon it did not pay to extract the toluol from the gases in which it occurs. With the increase in price, however, a number of stripping plants were installed and the production increased to something like 5,000,000 gallons per year.

When the United States entered the war there was a great shortage in toluol and steps were immediately taken, principally with Government assistance, to increase the production of this vital military necessity. Additional coke ovens were installed and stripping plants were put in in connection with every gas plant in the United States down to cities of about 100,000 population. Other processes for the production of toluol from crude oil were experimented with

and are being perfected. The Government has invested or loaned in the neighborhood of \$100,000,000 to increase the output.

About the middle of February, 1918, it was decided by the War Industries Board, acting in cooperation with the War Department, to take over and administer the entire production of toluol in the United States. Requisitions and commandeering orders to effect this were sent out by the War Department on February 26 to 93 producers and refiners of toluol, and the allocation of the toluol so requisitioned and ordered was turned over to the War Industries Board and to this section by the War Department.

The explosives committee decided to permit the diversion of not to exceed 5 per cent of this country's production for nonmilitary uses, and this section has been allocating this amount among the different industries.

Simultaneously with the production of toluol, there is produced benzol to the extent of from two to three times the volume of toluol, and also xylol and solvent naphtha to the extent of about one-half the volume of toluol. Benzol, xylol, and solvent naphtha have not been commandeered, although this section exercises supervision over them. At this time there is a large excess of these three bodies, both in productive capacity and in stock on hand.

Benzol is used to a considerable extent in the manufacture of picric acid, which is favored by the French and Italian Governments but not used to any considerable extent by the United States. There is a limited demand for xylol in the manufacture of T. N. X., and some demand for solvent naphtha, although in all three of these the supply is considerably in excess of the demand.

These three bodies can be used as motor fuel if mixed with an equal amount of gasoline, and some of the excess production of the country is being disposed of in this way.

The supply of oxygen, nitrogen, hydrogen, and acetylene—also handled by this section—is just about equal to the demand. The section issues priorities in cases of urgent need where it is able to take care of the demands in no other way. The production of these gases has increased more than 100 per cent since the outbreak of hostilities. None of these have been commandeered.

CREOSOTE SECTION.

A general survey of the creosote situation was undertaken by this section April 1, 1918, for the purpose of ascertaining the available supply, the probable production of the year 1918, the probable imports for the year 1918, the requirements of the Army, Navy, and Shipping Board, and the possibilities of increasing the supply.

From the facts thus obtained a report was made to the American Railway Association (the railroads being the largest users of creosote).

sote), and later to the Requirements Division of the War Industries Board.

In cooperation with other Government departments, a plan of conservation and substitution has been adopted whereby a considerable saving should result.

An additional source has been developed that should increase the supply about the first of the year by an amount estimated at 7,000,000 gallons, this creosote being obtained from distillation of wood.

While it is doubtful whether any increase in coal-tar creosote can be secured, due principally to the burning of coal tar by the steel companies, further investigation is being made, and it is expected that requirements can be met.

FERRO-ALLOYS SECTION.

The section was organized in March, 1918, to handle ferro-alloys, including the ores containing manganese, chrome, tungsten, magnesite, molybdenum, vanadium, cobalt, etc., also including the subject of ferrosilicon.

The problems connected with the work of the section have been those of getting statistical information in regard to domestic production, domestic consumption, and the necessity of importation of these commodities, in which work the section had the close cooperation of the Ferro-Alloys Committee of the American Iron and Steel Institute, and also the solving of problems connected with the distribution, domestic production, importation, and price regulation of these commodities.

MANGANESE.

In regard to manganese, the steel trade, through the influence of the American Iron and Steel Institute, has been induced to accept 70 per cent ferromanganese, instead of 80 per cent ferromanganese. This makes available a very large tonnage of American ores that are satisfactory for making 70 per cent ferromanganese, but unsatisfactory for making the 80 per cent product.

The shipping schedule has been agreed upon between the War Industries Board, the Shipping Board, and the American Iron and Steel Institute for the importation of ore from foreign countries, subject to revision August 15, 1918.

Coal has been obtained to start operation on the Central Railroad of Brazil, which was shut down at the time the section was organized, practically no manganese ore having been hauled to the docks at Brazil since January 20.

Manganese-ore prices have been advanced by the buyers, and an official price schedule has been agreed upon which should greatly

stimulate domestic production of ores. The buyers have further agreed to contract with reputable producers for a year on the basis of these official prices, thus stabilizing the market.

The activities of the section with regard to manganese include the lifting of embargoes on railroad transportation, the obtaining of priorities for the machinery, the amendment of freight rates, the authorization of sidetracks, the obtaining of food and machinery supplies for use of the mining interests in Cuba, and the arranging for the importations of ferromanganese from England when the shortage of Brazilian ore became temporarily acute.

Complete statistical information of production of domestic ore and importation of foreign ore is being obtained, and statistical information is being compiled that will allow distribution of American ores and foreign ores to blast furnaces for the most economical consumption.

CHROME.

In regard to chrome, shipping schedules have been arranged with the United States Shipping Board and the ferro-alloys committee of the American Iron and Steel Institute for importation of chrome ore from New Caledonia, subject to revision August 15.

The uses of ferro-chrome have been compiled with the tonnage required for each use. Economies have been started in the use of chrome in the steel industries, paint, tanning, and textile trades.

No prices have been fixed on the ore, but prices are high and domestic ore production is increasing. The same methods of keeping track of the chrome production and consumption and of encouraging the domestic production have been put into effect which have been described above regarding manganese ores.

Restriction of imports from Caledonia, Rhodesia, and other foreign countries has been arranged with the War Trade Board and Shipping Board.

FERRO-SILICON.

The problem at the date of the report is to obtain additional 80 to 85 per cent ferro-silicon to take care of the increased Army and Navy requirements of this commodity for manufacturing hydrogen gas for balloon service. Arrangements are being made for construction of new furnaces, as the present capacity is inadequate.

TUNGSTEN.

New estimates have been made as to the probable consumption during the next 12 months, and in view of the very large increase steps are being taken through the Conservation Division of the War Industries Board to conserve the use of tungsten in machine-shop practice by welding methods; also steps are being taken to increase

the production of tungsten, particularly in foreign countries, the idea being, if possible, to conserve the domestic supply. Conferences have been attended with representatives of France and England regarding an international control bureau on tungsten and recommendations have been submitted.

The other subjects handled by this section have not been as active as the three preceding, but information had been compiled, so that if an acute situation arose in regard to these commodities the situation would be well in hand. Some attention had been given to other commodities, such as fluorspar and graphite, when the occasion required.

FINE CHEMICALS SECTION.

This section was created April 23, 1918. Its aim has been, first, to gather all possible available statistical data relating to the importation and domestic production of materials required by and entering into the industry; and, second, to ascertain the needs of the various branches of the Government, the allied governments, and the civilian population. The more important products with which the section has dealt are bromin and bromides, camphor, celluloid, cinchona bark, coca leaves and cocaine, iodine, nux vomica and strychnine, opium, codeine and morphine, and quinine sulphate.

NITRATES SECTION.

In October, 1917, following an advance in price in Chile of some \$35 a ton for nitrate of soda, the War Industries Board took part in negotiations which were entered into to the end that the nitrate requirements of the United States and the allies might be secured on a more reasonable basis. These negotiations were carried on during October, November, and December, and were definitely consummated on December 10, 1917. This arrangement provided for the control of purchases of nitrates in Chile through a nitrate executive located in London, the necessary requirements of the different Governments at war with the Central Powers being allocated in accordance with their needs. Consul General Skinner represents the United States Government on the nitrate executive.

It was arranged that certain firms, which previously imported practically all the nitrate brought into this country, should buy on the Chilean market, under the direction of the nitrate executive, the nitrate required by this country for the manufacture of munitions, sulphuric acid, and other chemicals, and for fertilizer and other agricultural purposes. A form of contract modified to suit war conditions was prepared, the importers agreeing to buy nitrate, ship it to this country, and distribute it to consumers as allocated by the War Industries Board, at a gross commission of 2½ per cent over the landed cost, and to sell all nitrate needed for the United States Gov-

ernment at actual cost, plus out-of-pocket expense, the cost of the nitrate to be averaged over the month of purchase. Other small importers procure from these importers in Chile nitrate up to the tonnage delivered by them in the United States in 1917.

As a result of this plan the Chilean market price for nitrate has declined from around 15s. 6d. per quintal (Spanish 100 pounds equal to 101.4) to as low as 9s. 6d., reacting later to 12s. 6d., this latter price probably being justified by increased cost of production.

Arrangements were also made for the shipping of coal, fuel oil, etc., necessary for the manufacture of nitrate. A uniform shipping rate was established by the Shipping Board. These arrangements have resulted in a uniformity of price to all buyers of nitrate of soda.

During November and December the section arranged for the purchase in Chile, for account of the Agricultural Department of the United States Government, of 109,000 long tons of nitrate, to be shipped to the United States and sold by the Department of Agriculture to farmers for their own use at cost, this being figured at \$75.50 per ton. About 60 per cent of this tonnage has been delivered for spring planting.

Owing to the fuel situation and to disturbed shipping conditions during January, February, and March, stocks of nitrate in the United States were materially decreased. These shortages have, in part, been made up and all munition plants have been supplied with necessary nitrate of soda to maintain full production as far as this material is concerned.

It became necessary in March, 1918, to disapprove further contracts for the delivery of nitrate for fertilizer purposes, since all nitrate that could be transported to this country was needed for munitions manufacture and for the building up of reserves. This condition still existed at the date of this report.

That the arrangements for importing nitrate may be carried out and controlled, there has been organized in New York City a committee known as the Nitrate Committee of the United States. All contracts covering importation and distribution made by the importers are cleared through this office. Boats tendered by the Shipping Control Committee are allocated through the New York committee to the importers by the New York member of the Nitrate Section, Chemicals Division, in consultation with the Washington office of the section. All accounts of the importers covering their importations are audited by certified public accountants. Importers' representatives comprise the committee membership. Average monthly purchase prices for all countries are figured by the London executive and reported to the Nitrate Section for the use of the importers in invoicing shipments.

SULPHUR-PYRITES AND ALCOHOL SECTION.

The Sulphur-Pyrites Section was organized April 15, and the Alcohol Section about May 1. The sections are in charge of the same chief, and they are accordingly treated together in this report.

The section has endeavored to secure, by consulting all available records and by direct survey of the trades, data regarding its commodities to establish the total production and future possibilities, the total Government requirements and estimated future needs, the total Allied requirements and estimated future needs, the total civilian requirements and estimated future needs, and the total stocks on hand.

This data has been put in condensed form and copies are now in the section files, portions thereof having been placed in the hands of interested sections of the Army and Navy. Plans have been perfected for increasing production from available facilities and for opening up new facilities when conditions may require, and assistance is being furnished, where needed, to producers and users in obtaining car supply, fuel, and raw-material requirements.

SULPHUR PYRITES.

A survey of the sulphur situation developed that, due to increased requirements for sulphuric acid and to the fact that imports of Spanish sulphur-bearing ores have been restricted, a greatly increased demand for Louisiana and Texas brimstone had to be met. This necessarily threatened invasion of brimstone stocks on hand, as well as adding heavy burdens to the water and rail transportation systems.

In order to insure an adequate supply of brimstone to the Government plants and to acid plants filling Government sulphuric-acid contracts, and to provide for an equitable distribution to other sulphur users, a plan was devised by the commodity chief for controlling the production and distribution of sulphur-bearing materials without resorting to commandeering orders at this time. This plan was submitted to the War Industries Board, but action by the Board was still pending on the date of this report.

ETHYL ALCOHOL.

This commodity is used as a solvent in the manufacture of smokeless powder and also in the manufacture of poison gases. It is produced chiefly by two large corporations which use molasses and grain, respectively, as a raw material. There are a large number of independent distilleries, some of considerable size and well equipped. A careful survey of the alcohol situation was made shortly after the organization of this section, and it was found that while there was

ample operating capacity to provide for the then existing needs steps would have to be taken to see that certain of the idle plant capacity was started up in order to provide for the large and increasing needs for poison-gas manufacture.

A plan was devised, which is now in operation, which contemplated that the two companies, referred to above, should operate on their present contracts but that new Government business should be placed with the independent distillers so that the reserve capacity of the country would go into operation even though at less than the normal output. The additional plant capacity owned by the above two companies would be held as an insurance reserve against emergencies.

The Ordnance Department is letting contracts in accordance with this general plan of procedure, and the section regards the ethyl-alcohol situation as being thoroughly protected, with considerable latitude for large additional requirements.

Should unforeseen emergencies arise, by slight modification in the internal-revenue regulations, the plant capacities could be further increased.

PAINT AND PIGMENT SECTION.

The Paint and Pigment Section was organized May 6, 1918, with Mr. Russell S. Hubbard as chief. On that date a conference was held with manufacturers of white lead and red lead, who asked assistance in arranging for increased Government requirements no single manufacturer being able to bid on the Navy Department's entire requirement. It was arranged that Government orders should be allocated by the War Industries Board among the manufacturers with due reference to their several capacities, stocks on hand, and the railroad haul to the different navy yards. This allocation of orders, running into heavy tonnages, has the advantage of insuring shipment from nearer producing points and so lessening the burden on transportation.

CHROME YELLOWS AND CHROME GREENS.

Conferences were later held by the section chief with the Conservation Division of the War Industries Board, with paint manufacturers, color manufacturers, the War and Navy Departments, and other large users of chrome-yellow and chrome-green paints for the purpose of decreasing the use of these colors which compete with explosives by requiring acetic or nitric acid for the production of the necessary lead salts, and also impose a burden on the shipping situation, as the bichromates require for their production chrome ore which is imported from New Caledonia.

SHELLAC.

In a further effort to relieve the shipping situation, a study has been made of importations of shellac from Calcutta. This commodity

is used not only in the paint and varnish trade but also as insulating material and for cement in electrical work and in plastic form for manufacture of buttons, phonograph records, electric switches, etc. A conference has been held with importers and large users. The decision as to the proper method of controlling imports was not, however, reached at the date of this report.

VARNISH GUMS.

Similar work was done to determine what relief could be afforded the shipping situation by reducing the importation of these gums, which come chiefly from New Zealand and the East Indies.

Reduction of stocks and conservation of tin packages have been effected by inducing manufacturers to reduce the number of colors of paint and the number of different sized packages carried in stock in their warehouses and on the shelves of jobbers and dealers. A similar reduction has been effected in varnish manufacturers' stocks. These reductions are of importance as affording some relief in the shortage of tin.

PLATINUM SECTION.

By July, 1917, the War Industries Board, through the Chemical Division, realizing the vital importance of platinum in the conduct of modern warfare, had already, in cooperation with the Treasury Department, taken the first steps toward conserving the supply through an order issued by the Secretary of the Treasury withholding all platinum which passed into the United States mints.

Mr. L. L. Summers, the head of the Chemicals Division, did a large amount of preliminary work toward conserving the supply and securing the importation of platinum. Early in March, 1918, a separate platinum section was organized with Mr. C. H. Conner in charge.

The problems of controlling platinum involved: (1) Finding out through the various military departments what their requirements would be; (2) obtaining accurate knowledge of the amounts of platinum required by the essential industries. The objects aimed at were so to administer and distribute the supply that these demands would be met and a reserve gradually built up.

The necessary data, as outlined above, were gradually collected. It soon became apparent that in order to meet the requirements, which were steadily increasing, more drastic steps were necessary. The first requisition order, covering 14 firms, which represented the largest smelting, refining, and manufacturing plants in the country, was issued by the War Department on February 23, 1918. The requisitioning, however, of such a small number of manufacturers did not give a sufficiently wide grip on the situation, so that on May 1, 1918, requisition No. 104, effective June 30 and including 947 names, was

signed. In this requisition, iridium and palladium, which had been omitted from the first order, were also included. The direction of deliveries under these requisitions was delegated to this section by the War Department.

These two requisitions resulted in the delivery at the United States assay office, for account of the Government, of 11,152 ounces of platinum. In order not to disrupt the jewelry business, from which the bulk of this amount was received, the manufacturing jewelers were granted releases on a small percentage of their raw material, which aggregated 1,860 ounces. After the exhaustion of this supply the manufacture of platinum jewelry by requisitioned firms ceased. All other platinum not already manufactured is now being used, either for direct Government needs or for strictly essential purposes.

Prices were fixed by the Army Appraisal Board on the platinum so requisitioned after a number of conferences with this section, and the elimination of speculation which resulted from this stabilizing of the price was an important gain.

One of the most effective ways of spreading the supply of platinum thinly was to encourage the use of substitutes. This has been developed with good results in the dental profession, where the percentage of platinum now used will probably not total one-quarter of the amount consumed before the war. The character of each business has been carefully looked into, and often, with the help of the men themselves, we have been able to curtail their requirements either through the use of alloys or, in some cases, through eliminating platinum entirely by the use of substitutes. This work should have a marked and beneficial effect upon our 1919 requirements, which will show a very large reduction.

It was felt, however, that even with the most economical methods of distribution only a portion of the work would be done if efforts were not made to stimulate production wherever possible.

A great many letters have been received and interviews had concerning mining propositions in this and other countries. While the Government has no funds for such developments, this department has been of some assistance in helping to obtain facilities for development work, and efforts are constantly being made to encourage every possible source of supply.

With Russia, which heretofore has been the main platinum market of the world, practically eliminated owing to unsettled conditions the importance of Colombia has been materially enhanced. Imports from Colombia have shown considerable fluctuations, but have been averaging, roughly, about 2,500 ounces per month. It is felt that with the proper cooperation this channel can be developed in a more reliable and increasingly productive manner.

TANNING MATERIALS SECTION.

This section was created about May 1, 1918, and its principal function is to supply an adequate amount of tanning materials to tanners producing leather for Government use.

The principal tanning material used in the production of Government leather is quebracho extract, imported from Argentina and Paraguay. After several conferences with the Shipping Board, the War Trade Board, and the tanning industry, it was agreed that a maximum of 60,000 tons of solid quebracho extract would be imported during the portion of the year 1918 subsequent to July 10, that the Shipping Board would provide shipping space for this quantity of quebracho, and that licenses for the same would be issued by the War Trade Board, Bureau of Imports, subject to the allocation of shipping space, as made by this section. This procedure was deemed necessary in order to assure the tanning industry producing Government leather a supply of this essential tanning material.

Import licenses are only granted by the War Trade Board after they have been approved by this section, and in each instance the applicant for import license must accompany his application with a letter from the consumer stating that the extract for which import application is made is to be used in the manufacture of Government leather.

The section has also arranged, in conjunction with the Shipping Board and the War Trade Board, for the importation over the remaining portion of this year of a maximum of 15,000 tons of wattle bark, divi-divi, and mangrove bark, the wattle bark originating in East Africa and the divi-divi and mangrove bark in Central and South America. All three of these tanning materials are subject to allocation among the consumers producing Government leather, in a manner similar to the allocation of quebracho extract as described above.

The section has also endeavored to conserve the usage of chrome compounds in the tanning industry on account of the shortage of shipping space, and in conjunction with other sections of the Chemicals Division has inaugurated a conservation policy in the restricted usage of chrome compounds in nonessential industries.

The principal domestic tanning extract is chestnut-wood extract, produced almost exclusively in the Southern Appalachian district. There is shortage in the production of chestnut-wood extract, as compared with both demand and production capacity, due to labor conditions in the districts producing chestnut wood. The section is endeavoring to increase the production of chestnut wood by co-operating with the Department of Labor. Tanning-extract plants as well as tanneries are on Preference List No. 1 for priori-

ties on coal, and the section is daily in touch with the extract plants regarding their supply of coal, and holds frequent conferences with the administrator to assure a continuous supply. The section is at all times in close contact with the transportation section of the War Industries Board to facilitate the delivery of wood to extract plants and the transportation of extract to consuming points.

TECHNICAL SECTION.

The work of this section (which was originally done by the technical advisers of the Chemicals and Explosives Division, has been largely modified from time to time owing to the fact that commodities originally handled by the section or its predecessors became in many cases of so great importance that special sections were organized to handle them. Among these commodities are:

ELECTRODES.

Owing to the increased war demands, the production of electrodes was found to be entirely insufficient. Expansion proved extremely difficult because of the highly technical nature of the industry, the limitation of the raw material, and the complicated equipment required. The commandeering by the War Department of the electric power at Niagara Falls improved the situation somewhat, but the situation nevertheless became so acute during the spring of 1918 that it became necessary to allocate the product, giving preference to essential needs.

ABRASIVES.

Prior to the fall of 1917 abrasives used in the United States were chiefly imported and a serious shortage had developed. Toward the close of that year the industry at Niagara Falls was greatly expanded, and when the electric power at the Falls was commandeered sufficient power was allotted to the abrasive manufacturers to permit the full operation of all the furnaces then in use. Nevertheless, owing to the shortage of power during the winter due to ice in the Niagara River, and to delays in the arrival of imported abrasives, the shortage continued to be serious and the War Industries Board found it necessary to take hold of the situation in an extensive way. It was decided that the most good could be accomplished by doing everything possible to maintain a full production at Niagara Falls, as the plants in or near that point were capable of producing 92,000 tons annually, while the imports were only 1,649 tons in 1917 and about 9,000 tons in 1916.

The War Industries Board, therefore, arranged with the Railroad Administration and with the manufacturers of abrasives for the

transportation of raw materials sufficient to maintain an ample supply for present and future production, and further arranged with the Priorities Board to have the manufacturers of artificial abrasives placed on Preference List No. A and allowed to store coal for next winter's requirements.

Investigation proved the impossibility of distinguishing sharply between essential and nonessential uses, since an abrasive manufacturer may sell to a wheel manufacturer, who, in turn, sells to a manufacturer of tools which may or may not be used for war purposes. It was, therefore, decided to push the production of abrasives to the maximum and to trust to curtailment of nonessential production in general through restriction of fuel or transportation to reduce non-essential consumption of abrasives.

One of the most important of the results accomplished by the section was the bringing about of the manufacture of an artificial abrasive suitable for polishing optical glass. Prior to this time natural abrasives imported from the island of Naxos, Greece, were alone used for this purpose, and the importation of these natural abrasives was rendered very uncertain by the shipping and submarine situations. The artificial abrasives manufactured at Niagara Falls were found by the section to be satisfactory for all purposes other than the polishing of optical glass, and hence the section was able to agree with the War Trade Board on the embargoing of the importation of artificial abrasives and the restriction of the importation of natural abrasives.

Other commodities once handled by the Technical Section but now turned over to special commodity sections include caustic soda, chlorine, electrolytic cells, dyes and dyestuffs, alcohol, sulphur, acid brick and chemical pottery, pigments, and paints.

The duties of the Technical Section now are so varied that it is hardly possible to make a complete list of the subjects which come to it for consideration. It is easier to say that any mineral and any inorganic or organic chemical compound which does not belong under the general head of "heavy chemicals" would probably come before the section for consideration. It is constantly in receipt of communications from and called upon personally by men who wish to do some of the following things:

1. To increase the yield of a certain product.
2. To find some substitute for a commodity which is short or which has been commandeered.
3. To develop a more economical process for producing some commodity.
4. To develop a new source for a commodity which is short.
5. To procure material which is difficult to obtain and which is needed in industry.

6. To produce a product new for that company; such action proving desirable because of one of the following:

- (a) The former product is prohibited;
- (b) Demand for it has lessened; or
- (c) The new product has an increased demand for it.

In a few words, it might be stated that the section's duties involve the modifications of industries or processes which have been subjected to unusual conditions by the war.

In addition to the consideration of these many and varied problems of procedure which are submitted to the section for consideration and elucidation, Prof. H. R. Moody, of this section, has also handled in detail the production and requirements for the following: Ammonium perchlorate, ammonium persulphate, barium chlorate, bichromates, graphite, graphite crucibles, formic acid, glycerine (in conjunction with Mr. Reuter, of the Food Administration), lactic acid, magnesium, potassium chlorate, potassium perchlorate, potassium permanganate, radium, sodium chlorate, strontium compounds, special airplane dopes.

Prof. E. R. Weidlein, acting director of the Mellon Institute of Industrial Research, another member of the section, has also done a large amount of work both in Washington and in the laboratories of the Mellon Institute, in which latter work he has been able to give to the War Industries Board the benefit of results obtained on some of the industrial fellowships at that institution, which have had an opportune application to war problems, and through the patriotism of the donors to secure the services of "industrial fellows" on war problems.

The work done by Prof. Weidlein personally has included the finding of substitutes for acetone and acetic acid, the investigation of the manufacture of poison gas, the finding of a new process for manufacturing chlorine, and the making of reports on such subjects as the production of ethylene from oil gas, airplane fuel, the use of guanidine as an explosive, and the finding of a substitute for glycerine. Work is now in progress at the Mellon Institute on finding a substitute for platinum, and on airplane dope, airplane fuel, alloys, pipe coverings for fuel economy, and on various explosive and refractory materials.

WOOD CHEMICALS SECTION.

As the result of the efforts of the War Industries Board, Chemicals Division, and the equipment division of the Signal Corps, wood chemicals (including acetate of lime, acetone, ketone, crude wood alcohol, and refined wood alcohol) were covered by a requisition and compulsory order dated December 24, 1917, signed by the Secretary of War. By this requisition and order, delivery of said supplies was

to be made as directed by the War Industries Board. This was done in order to avoid the dissipation of stocks in the hands of the manufacturers and because of the vital importance of the commodities to the Signal Corps for the manufacture of cellulose acetate and other products, and also to the Allies.

To administer the requisition and order, the Wood Chemicals Section was organized. Some hundred concerns were served with the requisition and order and have had the deliveries of their supplies directed by this section since that time. An extension order was served to take effect on July 1, 1918, for a period of another six months.

A committee was appointed by the manufacturers to act in an advisory capacity with the Wood Chemicals Section and has proven most helpful. Meetings of the manufacturers of the various products were called in December, 1917, at which time investigation was made as to the prices to be fixed by the War Department for the materials covered by the requisition and order.

ACETATE OF LIME.

The principal products produced from acetate of lime are acetic acid, acetic anhydride, methyl acetate, acetone, and ketone. Efforts have been made to keep up to maximum the production of acetate of lime. Normal production was secured except for the months of January and February, when transportation difficulties and fuel shortage seriously affected the output. All possible assistance has been given the manufacturers in connection with their fuel supplies, transportation problems, priorities, etc.

As a result of the commandeering of acetate of lime and its allocation by this section, all but 13 per cent of the output of the United States is now going to the Government or to the allied Governments. The section has aided manufacturers who formerly used acetate of lime products to find substitutes.

ACETIC ACID.

Following the fixing of the new price of 4 cents per pound for acetate of lime by the War Department under the commandeering orders, prices were fixed on glacial and commercial acetic acid at a meeting held at the War Industries Board on February 13, 1918, at which all the acetic-acid manufacturers were represented.

A large percentage of the total amount of acetate of lime produced was formerly used in the production of acetic acid, and it was at once recognized as urgent that, in order to conserve acetate of lime for vital Government requirements, the various trades and industries using acetic acid should be classified, placing them on a basis where

they would be entitled to a certain percentage of their normal acetic acid requirements.

In a great many instances it has been found that lactic acid, formic acid, and vinegar (containing from 9 per cent to 10 per cent acetic acid) could be used as suitable substitutes for acetic acid. Vinegar is now being used in a number of important industries where acetic acid was previously used, notably in textiles, white lead, and insecticides.

ACETIC ANHYDRIDE

All the requirements of the aircraft program have been met. It is necessary to use acetic anhydride in the manufacture of aspirin. Figures submitted by the manufacturers showed their proposed production for 1918 were greatly in excess of the total amount produced in 1917, and it was deemed advisable after consultation with the medical authorities to place a limit on the total amount of aspirin to be produced in this country during 1918.

METHYL ACETATE

Shortly after the commandeering of wood chemicals, it became apparent that the production of methyl acetone was insufficient to supply the entire requirements of the United States Government and the allies. It was necessary to secure other solvents in order to fill the requirements. Acetone was considered out of the question, as it takes approximately 5 pounds of acetate of lime to manufacture 1 pound of acetone. Experiments were carried on by the aircraft authorities, and it was reported that methyl acetate had the proper solvent properties and would do the work in a satisfactory manner.

At this time there was only one concern in the country producing methyl acetate, but several other concerns were interested. These concerns were called together and questions discussed relative to the production of methyl acetate. It was agreed that the product should be 80 per cent methyl acetate, and prices were fixed on this material at 21 cents per pound based on the aforementioned new prices fixed on methyl alcohol and acetate of lime. There are now five manufacturers actually producing methyl acetate in sufficient quantities to fill requirements. Standard specifications were prepared and have been supplied to the manufacturers. Practically all the methyl acetate is used as a solvent in aeroplane dope.

ACETONE AND KETONE

The requirements of the British War Mission, which also include the requirements of the other Allies, have been very large, over 50 per cent of the acetate of lime production being used for this purpose. Both acetone and ketone are practically all used for Government business, and only small quantities essentially needed for the

production of drugs, chemicals, rubber testing, and acetylene gas have been released to the industries. The Mellon Institute of Pittsburgh has cooperated with this section in working out substitutes.

REFINED WOOD ALCOHOL.

In order to secure the very large amounts of alcohol needed for Government use, it was necessary to eliminate the use of methyl alcohol in various industrial work. Denatured alcohol was suggested in a number of cases where it could be successfully used as a substitute. The refiners were all notified that it would be necessary to curtail the production of denaturing grade wood alcohol to 50 per cent of its former production, as other denaturing agents were available.

METHYL ACETONE.

Methyl acetone replaces pure acetone or ketone in certain uses. Practically all the methyl acetone formerly produced in this country was utilized by various trades and industries as a solvent in artificial leather, celluloid manufacture, varnish remover, etc. All these requirements have been eliminated, and these industries are now using wood alcohol.

JOINT OFFICE ON CHEMICAL STATISTICS.

The Joint Office on Chemical Statistics, organized in January, 1918, as an outgrowth of the Division of Statistics of the Council of National Defense, is an office comprising representatives of the Army, Navy, and War Industries Board, to gather and assimilate all information obtainable on explosives and propellants and raw materials used in their manufacture.

This office prepares a bulletin entitled "Propellants and Explosives," which appears semimonthly, and is forwarded to the persons concerned. The Joint Office on Chemical Statistics was organized under the supervision of the Army, Navy, and War Industries Board representatives, so that valuable information might be obtained from all these sources, and it issues reports containing the best available information from all these sources combined.

The office sends a questionnaire to manufacturers with regard to materials which they are particularly interested in, whereby this office receives information as to certain factors regarding their production and raw materials used in their manufacture. Through this information, obtained directly from the manufacturers, reports are made, graphic presentations published, and statements made up and sent to the persons directly interested in the facts represented.

COTTON AND COTTON LINTERS SECTION.

The organization of this section was begun on April 4, 1918, with the appointment of Mr. George R. James as chief of the section,

under instructions to investigate the cotton-linters situation and to determine the seriousness of the threatened shortage in the available and prospective supply of the commodity as related to the Government requirements of linters used as the basis for explosives.

With this as a starting point, the building of the section was begun, and a series of investigations were made which developed the fact that the average of five years' production was less than one-half of the amount of linters needed for the prospective requirements for the year 1919, and that the stock available from previous years would take care of the requirements (with a small surplus) to August, 1, 1918.

COTTON LINTERS. -

The activities of the section with regard to cotton linters have been carried on with the cooperation of the United States Ordnance Department, the cottonseed crushers (as representing the producers of linters), the hull-fiber manufacturers (making a supplemental substitute for linters), the linters bleaching industry, the manufacturers of press cloth (used by cottonseed crushers), and the manufacturers of explosives.

A harmonious relationship has been established between all interested parties, and prices have been regulated by agreement under the supervision of the Price Fixing Committee of the War Industries Board.

Numerous meetings of the section have been held and frequent conferences had with the industries at interest, and, by agreement, various rules have been formulated and promulgated to govern the different features of cotton-linter production, bleaching, etc.

In order to equalize the expenses involved in the purchasing, financing, inspecting, shipping, storing, and distributing of the supplies of linters, and to secure the maximum quantity producible, a pooling arrangement has been provided for taking care of the interests of the United States Government and the Allies.

As the interests of the Government in cotton linters center in the Ordnance Department, by agreement between the Navy and Ordnance Department representatives whereby the Navy is to secure its requirements through the Ordnance Department, an agreement has been reached between the Ordnance Department and the Cotton and Cotton Linters Section of the War Industries Board under which the section is to have charge of the following matters:

Allocations of supplies in accordance with the requirements of the United States and Allies.

Storage of mattress or high-grade linters to be held against prospective requirements of the Medical, Quartermaster, Ordnance, and other Governmental Departments, the American Red Cross, the Allies, or others as may be deemed essential.

Storage or warehousing of munition linters that may be produced during the crushing season temporarily in excess of the consumption or storage capacity of the Government plants or contractors.

Rules regulating manufacture of linters, which shall be in harmony with specifications and requirements of the United States and Allies.

Reports from manufacturers showing stocks, amount produced, estimates of production, etc., at stated periods.

Records of stocks, production, requirements, and allocations.

The "pooling arrangement" previously referred to whereby all linters shall be purchased—subject to allocation by Cotton and Cotton Linters Section—and expenses incident thereto shall be prorated, is under the joint control of the Ordnance Department and of this section.

COTTON.

Considerable thought and attention has been given to the conditions surrounding the cotton situation as it exists at the present time, which has been found to be extremely chaotic, in that because of a shortage of over-seas transportation and spinning capacity there is a surplus of raw material now in existence, which will be very largely augmented with the maturity of the growing crop.

LUMBER SECTION.

Shortly after the declaration of war with Germany the very serious problem of securing for the Government an adequate supply of lumber was presented. This material was to be used in the construction of shipyards, ships, training camps, embarkation camps, warehouses, factory construction, aircraft construction, and many other uses in this country, as well as timbers for docks, bridges, trench work, and camps over seas.

After careful consideration agreements were made between the Raw Materials Division of the Council of National Defense and the representatives of the industry, as to the prices on various items of lumber. As a result of these agreements with the manufacturers the several lumber emergency bureaus were organized so as best to serve the requirements of the Government. The Government departments requiring lumber submit their needs to this section, which in turn recommends these orders to one or more of the bureaus best equipped to handle the particular order. It will thus be noted that the bureau manager of each district is the authorized distributing agent for Government orders, endeavoring to distribute them proportionately among the various mills, and having in mind always that maximum efficiency must be obtained for the Government.

On July 1, 1917, the mill-run average paid for southern pine was approximately \$24.85 per thousand feet. Reductions in this price were made, effective September 11, October 11, and November 11, the total reductions amounting to approximately \$1.65 per thousand feet from July 1, 1917.

The first large construction work undertaken by the Government after the declaration of war were the National Guard and National Army cantonments, requiring upward of 1,000,000,000 feet of lumber. This first rush of cantonment construction was largely over by September, 1917, and since that date the other requirements of the Government have consisted principally of over-seas shipments, interior depots, factory plants, shipbuilding and shipyards, as well as airplane lumber.

The shipments on account of Government lumber requirements handled by this section for the period July 1, 1917, to May 28, 1918, will be found to approximate 2,600,000,000 feet. This total does not include various small local purchases, nor does it take account of indirect Government contracts, such as munition boxes, and other similar contracts requiring lumber.

At the inception of this work in July, 1917, the first consideration was given in the necessity for promptly and efficiently supplying the Government with the amount of lumber which was anticipated at that time, serious consideration also being given the necessity of coordinating the producing sawmills of this country and at the same time maintaining reasonable prices for all. During the period covered by this report Government lumber prices were adjusted from time to time with the industry and have been considered fair and reasonable, after careful consideration of all factors, and since December, 1917, guidance by reports from the Federal Trade Commission. These Government lumber price lists have from time to time had the approval of the Secretary of War and other proper authorities, and, as above stated, the price of southern pine on May 28, 1918, was approximately \$1.65 per thousand less than the price prevailing July 1, 1917, after having handled upward of two and one-half billion feet of Government lumber requirements.

MICA SECTION.

The Mica Section was formed in the early part of 1918 as a section of the Chemicals and Explosives Division.

The problem before the section has been to secure high-grade mica for electrical purposes, such as magnetos, washers, insulation for spark plugs, and field-telephone equipment.

Steps have been taken by the section to secure figures showing requirements of the Army and Navy as well as to show available stock and production.

WOOL DIVISION.

Early in the spring of 1918 it became apparent that the military needs for wool would be such that unless limited by some governmental action the price would go unduly high. Accordingly, on the 19th day of April, the Price Fixing Committee of the War Industries Board began holding a series of meetings with representatives of growers, dealers, and manufacturers, with the result that the price to be paid for the domestic clip for 1918 was established on the basis of values which prevailed in Boston on July 30, 1917, for the various grades of wool.

At the same time the Wool Division of the War Industries Board was created to take charge of such matters as would pertain to the handling of the 1918 clip. In the "territories" which comprise the Western States, where two-thirds of the wool is grown and where the sheep are owned in larger numbers, it was arranged that the wool growers should not sell their wool locally but should consign it to the larger concentration points. In the "fleece-growing section," that is, in the Middle West and East and Southeast, where the flocks are smaller, arrangements were made which enabled the growers to sell their wool locally if they wished to, the profit of the local purchaser, however, being limited to $1\frac{1}{2}$ cents per pound. These local purchasers in turn were then asked to consign the wool to the larger concentration points. The plan provided that the dealers in the concentration points were to be allowed a commission of 4 per cent on wool from the fleece-wool sections and 4 per cent from the territories, provided the wool is sold in the original bags, and $3\frac{1}{2}$ cents if graded, these latter commissions to be paid by the Government and to be added to the price of the wool.

The regulations provided that after the wool had arrived at the concentration centers it would there be appraised by Government valuation committees and then allocated to the mills for military or civilian needs.

The primary purposes of these regulations were:

1. To enable the Government to move the wools as rapidly as possible from the hands of the grower to the mills.
2. To protect the grower and the Government against the making of undue profits by the middle-man.
3. To permit of a complete check on the entire wool production of the United States so that it would be appraised and controlled by the Government, in order that Government requirements should be taken care of before civilian needs.

A branch office was opened in New York to take care of noils and waste, and regulations were adopted regarding pulled wools. Special regulations were adopted to take care of unusual local conditions in

California, New Mexico, and North Carolina, and wool produced by the Navajo Indians of the Southwest.

Under this plan the wool is moving more rapidly than in former years and at this date is going into the concentration centers and is being distributed from there to the mills in a manner which, except for a few minor difficulties which have not yet been entirely eliminated, is entirely satisfactory.

Each State agricultural college in the United States has been requested to delegate some member of its staff to cooperate with the Wool Division of the War Industries Board and to keep in touch with the growers and render them assistance in handling their wool under this plan. A great deal of assistance has come from this source, it being the important point of contact between the grower and the governmental agency carrying the plan into effect.

FINISHED PRODUCTS DIVISION.

The Finished Products Division has exercised general supervision over that part of the work of the War Industries Board implied by its title. Assisting the Government departments in getting supplies and arranging new sources of supply through conversion and development for war needs, it has worked particularly with the commodity sections whose efforts are outlined in the detailed reports following.

RESOURCES AND CONVERSION SECTION.

The duties of this section, functioning with the Finished Products Division, are to assist the Government and manufacturers in the conversion of industrial plants from the manufacture of products which are not essential, from a war-time standpoint, to the manufacture of those which are essential, thus preventing unnecessary loss to such manufacturers and providing for the needs of the Government without unnecessary construction of new plants.

The section has had a part in the conversion of over a hundred plants, and has also, in cases in which no definite conversion of a plant has been made, advised the purchasing departments of the Government with regard to the possibility of placing contracts for war material with industries such as the automobile industry, whose ordinary business has been reduced owing to inability to obtain raw materials for the regular product.

INDUSTRIAL INVENTORY SECTION.

Additional inventories to the number of some 10,000 have been received and properly classified. Many of the original inventories which were lacking in essential information and antiquated have been brought up to date. Approximately 30,000 plants had been inventoried on May 28.

All of these surveys were classified according to the 1914 Census of Manufactures classification. This was found to be entirely inadequate, as it was mainly a finished-product classification. A capacity or process classification was adopted and all inventories carefully reclassified. The war requirements were such as to warrant this reclassification, as requests were for plants with specified producing equipment rather than for plants manufacturing specific products. This section is in a position to make possible an intelligent decision on the part of the War and Navy Departments, the Emergency Fleet Corporation, and the commodity sections of the War Industries Board as to a plant's general fitness as a source of supply for Government requirements.

The official 1918 industrial inventory form has been circulated where it was apparent that the section did not have sufficient information covering certain industries, and in particular where a shortage of capacity seemed evident, and where conversion from prewar to war work was logical.

These surveys are properly filed to furnish and do furnish valuable information to many Government agencies interested in sources of production for war requirements. New reports are constantly being secured and made available to governmental organizations in need of them.

COMMODITY SECTIONS.

(Finished Products.)

CHAIN SECTION.

The Chain Section was organized on April 11, 1918, for the purpose of obtaining data as to sources of supply for chains to fill Government demands.

On April 25, at the request of this section, a meeting of chain manufacturers was held in the War Industries Board building, which was attended by 22 manufacturers, representing 90 per cent of the tonnage of the country.

On the same date the first conference of this section with representatives from the various governmental departments was held. The Army and Navy were each represented at this meeting, and it was decided that thereafter weekly meetings should be held, at which each of the governmental departments would be represented, and by May 22 all interested departments were represented in the section.

Owing to the vastly increased production schedule of the Shipping Board, it became necessary to create new and greatly enlarged facilities for the manufacture of heavy ships' cables, and inasmuch as the shortage of certain varieties and sizes of chain was quite apparent, manufacturers were urged to increase their production on the sizes indicated, and one large foundry company was encouraged to embark in the manufacture of cast-steel chain upon recom-

mentation of the chief of this section, after the required specifications for testing had been approved by the American Society for Testing Materials, American Bureau of Shipping, and Lloyds Register of Shipping.

In the formative period of this section the rapid assembly of needs and requirements necessitated numerous visits to plants looking to the coordination and the stimulation of production, and visits by either the chief or his assistant, or both, were made to the number of 14 during the period under review. Other processes than those already in use in this country are still under consideration and investigation.

A rapid survey of the field disclosed that, prior to the organization of the Chain Section, orders had been placed not only in districts already congested but with factories less able to manufacture the size and type of chain ordered than might otherwise be obtained, which was one of the factors showing the need of cooperation and improved allocation of orders.

AUTOMOTIVE PRODUCTS SECTION.

The Automotive Transport Committee was continued as an advisory committee under the Advisory Commission of the Council of National Defense until September 4, 1917, at which time this committee was reorganized and placed under the War Industries Board of the Council and was thereafter known as the Automotive Products Section operating under the direct supervision of the Commissioner of Finished Products.

During the year the section aided in the allocation of Government business, advised on questions of price, and advised on purchases by the United States Government and the Allies of the following commodities:

Motorcycles, motorcycle side cars, motor cars, motor trucks, motor-truck bodies, motor-truck tractors, motor-truck trailers, armored cars, military tractors, military tanks, marine gasoline engines, automotive accessories, and automotive parts applicable to airplanes.

CLASS B MILITARY TRUCK.

The Motor Transport Division of the Quartermaster Corps outlined certain specifications for military trucks based on Mexican conditions and opened bids for trucks on July 11, 1917. There was so great a divergence in observance of the specifications that it seemed impossible to get trucks containing all features of the specifications. The parts manufacturers were summoned by the Automotive Products Section, and they offered to produce parts observing the specifications in exact detail.

The Automotive Products Section mobilized all available resources for the Army, and the Army was enabled to obtain the type of truck

specified. Through the aid of the Society of Automotive Engineers its members were summoned, and a group of 50 men were selected by the Quartermaster Corps to work out a complete class B truck. A subcommittee, known as the Military Truck Committee, acting under the Automotive Products Section, was formed to advise the Quartermaster Department regarding the organization and policies necessary to produce the truck. The personnel and the policies adopted were the result of the Military Truck Committee's work.

The drawings for class B truck were begun on September 1, and two trucks were started for Washington from Lima, Ohio, and Rochester, N. Y., on October 10. On October 14 both trucks had arrived at Washington, and on October 19 they were accepted in behalf of the United States by the Secretary of War and were presented later to President Wilson. On July 1, 1918, 5,000 class B trucks had been produced and accepted by the Government, 18,000 in all had been ordered, and the War Department had adopted this truck as the standard heavy-duty cargo truck.

The Automotive Products Section advised as to the allocation of purchases of a large volume of the automotive apparatus of the Government, amounting to over \$400,000,000, and the section, by its advice as to purchases and prices, was able to save large sums of money for the Government.

During the year two marked shortages occurred. The manufacture of magnetos for the Government trucks, tractors, and airplanes was threatened due to the shortage of platinum. An investigation by the section demonstrated that drastic steps were necessary and so advised the Raw Materials Division, with the result that a serious shortage was averted. There developed likewise a serious shortage in mica of such qualities as are used in magnetos and wireless apparatus. Producers, importers, jobbers, and users of mica were called together. This resulted in the discovery of sources of domestic mica which was the equivalent of any India mica for electrical purposes.

In cooperating with the Allied Purchasing Commission, the Automotive Products Section saved the Allies large sums of money by advice as to prices, and was instrumental in securing supplies for them at the same price as were paid by the United States Government.

CRANE SECTION.

During the latter half of 1917 the direct Government requirements for locomotive cranes had reached a point which indicated the possibility of an acute shortage in the near future, and the Crane Section of the War Industries Board was established on November 12, 1917, to make a survey of the situation and determine the method of procedure to avoid an actual shortage.

Data was immediately collected covering the available output of the regular locomotive-crane builders as well as the possible future output of such builders whose plant could be easily diverted to the production of locomotive cranes. The most fruitful opportunity in the latter case was presented by the builders of steam shovels, whose plants, with comparatively slight changes, could be modified to take care of locomotive-crane requirements.

At the same time an estimate was obtained of the actual direct Government requirements for locomotive cranes, from which it appeared that only about 20 per cent of the regular producing capacity of the country would be taken by direct Government orders. It then became apparent that the shortage was more apparent than real and due largely to the lack of distribution of orders throughout the available sources of supply. The locomotive-crane builders were immediately requested to make weekly reports of their manufacturing schedules, which reports have been continued without interruption. From these reports it was seen that the indirect uses for war work were very much in excess of the direct requirements of the Government departments, but an adequate supply was maintained by controlling the situation through priority certificates, refusing to recommend priorities on the companies most heavily filled with war orders, and recommending transfer of orders in such cases to other companies in better position to make early delivery.

In addition to encouraging new sources of supply, as above outlined, the regular builders were encouraged to increase their output without extensive additions either by buildings or equipment, so that although the direct Government requirements increased from the original estimate of 20 per cent of the available output up to 40 per cent of the available output, the delivery situation was improved from an average of $4\frac{1}{2}$ months' delivery in November, 1917, to $3\frac{1}{2}$ months' delivery in March, 1918.

In April the direct Government requirements were apparently increasing to such an extent that the Crane Section recommended that all Government departments prepare definite estimates of their locomotive crane requirements for the balance of 1918, and place their orders well in advance for their entire 1918 requirements, in order that the Government departments might be assured of an adequate supply of cranes without upsetting manufacturers' schedules to the extent that might unfavorably affect production and without interfering unnecessarily with other indirect war requirements for locomotive cranes. At the end of the period covered by this report such a plan was well under way, although not completed.

Besides providing for sources of supply for direct as well as indirect Government requirements in new locomotive cranes, the section furnished information with respect to the available sources of supply

on second-hand locomotive cranes to provide for urgent war requirements where the purchaser could not wait for the longer delivery required to secure a new crane.

In general, this same procedure was followed with respect to handling the requirements in electric traveling cranes, and regular schedule reports have been received from the electric traveling crane manufacturers, upon which the actions of the section has been based. Here, again, there was no real shortage, in fact, rather less so than in the case of locomotive cranes, the only difficulties in securing suitable deliveries for war requirements having arisen from an uneven distribution of orders throughout the available sources of supply.

The section has also handled the various other types of cranes and machinery manufactured, in general, by the crane industry, such as gantry cranes, shipbuilding cranes, wrecking cranes, steam shovels, grab buckets, electric hoists, monorail man trolleys, etc., but during this period there developed no real shortage in the supply of these commodities.

The section has reported to the Priorities Committee recommendations covering all applications for priority on the commodities handled by this section. The number of priority applications presented for recommendation amounted to an average of 130 per month.

The section also acted upon all requests for purchase by the allied Governments, covering the commodities handled by the section, the principal purchaser among the Allies being the Republic of France.

ELECTRICAL AND POWER EQUIPMENT SECTION.

At the inception of the section a survey of the country was undertaken for the purpose of securing reliable lists of available electrical equipment. During individual conferences and upon receipt of applications for priorities, suggestions have been made as to the location of similar equipment which not only offer immediate delivery but tend to conserve man power and materials in factories that would be called upon to manufacture such equipment when not available from stock.

Many conferences are held daily with officers from various Government departments, and more particularly with companies intending to supply equipment other than electrical, but which, in turn, are in need of equipment for the production of their own commodity. The purpose of these conferences is to indicate the sources of supply, to suggest alternate means of accomplishing the same purpose which would require equipment of lesser demand, so that congestion in the manufacturing lines might be avoided wherever possible.

The section has before it a comprehensive plan of standardization which is desirable in itself and which will in addition naturally result in conservation of both materials and productive energy.

FELT SECTION.

An important matter to which the War Industries Board turned its attention in September, 1917, was the felt industry. The term "felt" in itself is exceedingly broad, covering a wide range of different types and styles of felt goods, constructed from various types of raw materials upon which almost every governmental department leans for the fulfillment of its portion of the war program.

The Government uses felt for airplanes, tractors, motor trucks, automobiles, explosives, bombs, depth bombs, cartridges, gun wads, canteens, helmets, gas masks, ammunition boxes, Browning guns, hats, caps, uniforms, insignia, chevrons, splints, for orthopedic uses of the Surgeon General's Department, saddles, harness, packing of ammunition, packing of airplanes, mine sweepers, shipbuilding, torpedo boats, for Red Cross purposes, etc., and the Government requirements of felt for such purposes were found to require the greater part of the production of the entire felt-manufacturing industry.

The Felt Section for a period simply acted in an advisory capacity to the Government departments interested, and assisted them in drawing up correct specifications covering the different types of felt needed for the specific purposes for which it was intended to be used. The Felt Section likewise assisted the departments in placing contracts with the mills that were most adapted to manufacture the particular type of felt desired.

With the growth of the war program the requirements for felt increased, with the result that it became necessary for the Government to assume control of the felt industry in order to secure sufficient supplies of felt to cover these requirements.

The industry at large realized that such a step was not only essential for the Government to take, but that it would be in the interest of the industry as well to have the Government assume control and allocate contracts in such a manner as would lead toward the proper distribution of the work to such mills as were best fitted to produce the desired materials.

Since the assumption of the control of the production of felt, direct Government contracts are allocated and indirect Government contracts are allocated when it is found essential to secure the desired deliveries; and, in addition, the production of felt for the civilian industries necessary for the adequate maintenance of the civilian population during this emergency is maintained under direction of the Felt Section.

The Government has no wools available that could be allotted for the manufacture of felt for any strictly nonessential purposes, and the Wool Section of the War Industries Board and the Felt Section act jointly in this regard by the refusal to allot Government-owned wools to mills desiring them in order to produce felts for nonessential purposes.

HARDWARE AND HAND-TOOL SECTION.

The Hardware and Hand-Tool Section was created about October 1, 1917, as the Small-Tools Section.

Up to May 1, 1918, it was not considered that an actual shortage existed in the lines under the jurisdiction of this section. Considerable information, however, along the line of sources of supply was furnished the various Government departments whenever requested. Assistance was rendered the Allied Purchasing Commission in connection with the placing of orders for the Allies.

The section rendered important assistance in needles, of which a shortage existed on almost all types. New sources of supply, especially on surgical needles, were developed. Prior to the war, these had been entirely imported, very largely from Germany. With the increasing difficulty in obtaining optical glass for the Government, the Small-Tools Section gave special attention to that subject until the creation of the Optical Glass Section.

In May a shortage which had undoubtedly been accumulating throughout the spring, due to the unusual Government demands, became more apparent in some items. Consequently, investigations were started, dealing with the commodities where the situation was most acute. Information was and is still in the course of being procured as to sources of supply, present production, and possible extension of facilities in order to insure adequate protection to the orders of this country and of the Allies.

It is the intention of this section to continue similar investigations of commodities in which the situation is acute or approaching a shortage. On items where the supply very evidently exceeds the demand it is the purpose to obtain information of a general nature but received from authoritative sources. Close touch will be maintained with the situation in order to investigate in greater detail, if necessary.

HIDE, LEATHER, AND TANNING MATERIALS SECTION.

The Hide, Leather, and Tanning Materials Section of the War Industries Board had its origin in the Quartermaster's Department in early February, 1918, at the time Gen. Goethals organized the Supply and Equipment Division (now the Clothing and Equipage Division).

In the month of March a situation arose which called for the control and price fixing of pickled sheepskins from which leather is made for jerkins. As this was distinctly a War Industries Board function it was carried there for agreement with the trade, and on March 26 Mr. C. F. C. Stout was appointed chief of a section for the handling of all matters in connection with the hide and leather industry.

The Government makes practically all of its purchases of leather equipment from the standpoint of the finished or fabricated article. In the past this necessitated getting options on hides from the dealer and options on leather from the tanner in order that the Government contractor might have a basis of cost from which to figure, but as there were no obligations along the line to take up these options they caused considerable hardship.

From the establishment of the hide and leather control the Government has built its leather equipment from the hide up by a well-defined, well-organized program wherein there is control and allocation from a central body of suitable hides and the manufacture of suitable leather by means of an intelligent system of guidance and supervision.

The elimination of nonessentials in the industry and the practicing of economies are worked out by the shoe-manufacturing and shoe-retailing branch in conjunction with the Conservation Division of the War Industries Board.

Briefly, the purposes of the Hide, Leather, and Tanning Materials Section are as follows:

1. To serve all branches of the Government in their war demands for all articles requiring leather.
2. To protect and provide for the civilian requirements.
3. To provide for the requirements of the Allies.
4. To protect the industry from the collective buying of other nations both from within and without.
5. To stabilize prices by governmental control and to place the industry on a war footing by the elimination of nonessentials.
6. To allocate materials where shortages occur.

It is estimated that the United States during the years 1915, 1916, and 1917 depended upon imported leather raw stock to the amount of approximately 50 per cent cattle hides, 55 per cent calf and kip, 66 per cent sheep and lamb, 97 per cent goat and kid, and its export trade probably amounted to 35 per cent of its production. In cooperation with the Shipping Board for the release of tonnage for the War Department and the Food Administration for trans-Atlantic service for the prosecution of the war, restrictions on imports have been made which have deprived the industry of some 10,000,000 cattle hides and kips and about 90,000,000 goat and sheep skins, and

the tonnage allotted for the importation of leather raw stock is confined entirely to requirements for war necessities. The industry will be called upon for large quantities of leather, and the entire situation will become more and more involved with the shipping problem as the war progresses.

It was the consideration of the facts above enumerated which caused the section to come before the Price Fixing Committee to fix prices on hides and skins. This was accomplished on May 1, and will be renewed August 1, 1918. Prices of harness leather have also been fixed.

Attached hereto are reports of the several subsections, subordinate to the Hide, Leather, and Tanning Materials Section.

SOLE LEATHER.

The duties of the Sole Leather Section have been to see that suitable sole leather was provided, not only for the Army, but for the Navy, the Marine Corps, the Red Cross, and other Governmental branches and for the Allies as well.

This branch maintains a supervising force in the field who travel about examining the quality of the sole leather being used in Army shoes, visiting not only the shoe factories but the tanneries as well. It aims to assist tanners in producing good sole leather and prescribes the specifications under which the leather is bought for the shoe.

On assuming its duties about March 2, 1918, an immediate thorough investigation was made, and changes were made in a number of factories which resulted in a very decided improvement in the leather going into Government work.

In order to create a sufficient surplus of heavy leather, which will be available at all times for Government needs, this section has restricted the tanners, sole cutters, strip and block cutters, and shoe manufacturers in the sale and use for civilian trade to leather such as is not suitable for Government shoes.

Reports are received weekly from all tanners as to any accumulation of heavy Government requirements of stock so that distribution may be made to Government shoe manufacturers who have been unable to procure the necessary sole leather to cover their contracts.

Weekly reports are also obtained from the shoe manufacturers showing the progress that is being made on Government shoe contracts and any delinquency in the delivery of heavy sole leather from the tanner with whom contracts have been placed. Further weekly reports are obtained from the sole cutter who may be supplying the Government shoe contractors with cut soles. By means of these various reports this section is at all times familiar with the progress being made by the Government shoe contractors, and is thus in a

position to lend aid to the manufacturer who is being delayed in his work through inability to secure prompt supplies of heavy sole leather or cut soles.

UPPER LEATHER.

Prior to the organization of this section no definite policy as to the grades and the kinds of leather required in Army shoes had been adopted. A so-called Chrome Re-tan Side leather was used for the upper of the shoe, which was made by all tanners of the country under no general supervision. Certain principles as regards the manufacture of leather were prescribed, many of which were faulty; the result being that in general the upper leather being produced for Army shoes was of a low grade and not nearly of such a standard as could be produced and has since been produced. The leather was made of very large hides, which were coarse and open, and not of the best quality.

After many conferences and meetings, both in Washington and throughout the country, with upper leather manufacturers, certain definite rules with regard to the manufacture and preparation of this leather, which have brought about great improvement, have been laid down. The production of upper leather for Army shoes has been standardized. Now this leather is made out of what is known as a bend, which means that the flanks and undesirable portions of the hide are trimmed off by the tanner before the leather is delivered to the shoe factory and in this way only the best leather can be cut into the shoe.

The old-fashioned bark-tanned leather, which was requested especially by the overseas command, is again being produced. No such leather had been made in this country for some time past, and during March and April the tanning industry of the country has been put in a position to produce this class of leather in quantity.

A system of supervising at the tanneries the manufacture of all leathers being produced for Army purposes has been inaugurated and thus shipments of undesirable leather to shoe manufacturers has been prevented.

A comprehensive system of statistics, which enables the section to know from week to week how production is coming along, and which also enables the Shoe Committee to judge intelligently whether a contractor is behind because of slow delivery by the tanner or whether his delinquency was of his own making, has been organized.

The section has aided in the general policy of conservation, has furnished much information requested by the Price Fixing Committee in the matter of price-fixing on raw materials, and has co-operated with the Procurements Division in the matter of obtaining suitable leather for gloves for the Army. Purchases for the Red

Cross at advantageous figures have been negotiated, and assistance has been given to the representative of the British Government in the purchase of suitable leather for their civilian population.

HARNESS, BAG, AND STRAP LEATHER.

After organizing the Harness, Bag, and Strap Leather Section it was apparent that the important first step would be to establish such a supervision of the industry as would enable the section, by means of periodical reports from the trade, to see that the Government contractor for harness, on the one hand, would be regularly supplied with leather of proper quality, and that the tanner of leather of the proper grade, on the other hand, would find a market for his production. Accordingly a system of reports was established by which the amount of leather on hand in the tanneries is reported each month, and the state of the various contracts for the manufactured harness is also ascertained. These reports are carefully checked and compared, and the section is thus enabled in many cases to direct a contractor to the different tanners who might supply him with leather of proper quality and to suggest to a tanner in other cases the names of manufacturers to whom he might submit his product.

It is evident from the requirements that a very large quantity of harness leather, both black and russet, is still needed by the Government, and it will require the most careful supervision of this industry to see that these needs are adequately provided for.

SHEEPSKIN AND GLOVE LEATHER.

Sheepskins.—This section began work in March, about the time the authorization for 3,000,000 sheepskin Army jerkins came. The sheepskin market was very bare of raw stock, and it was found necessary to establish immediate control of all sheepskins suitable for jerkins in order to secure the large quantity needed for the Quartermaster's requirements.

A meeting of the wool pullers was called on March 20, and an agreement was made with them that their output would be made available to tanners approved by this section for the manufacture of leather for Army jerkins. Since that date an inventory is taken once a month of the sheep and lamb skins produced in this country. Control of sheepskins is exercised from the time they originate with the wool pullers until the Government regains the pelts in the form of Army jerkins, motorcycle caps, aviators' helmets, and aviators' coats and flying suits, and other equipment. In the case of foreign skins arriving in this country a similar control is in force, sheepskins coming in being all under option to the Government.

The leather used in Army jerkins prior to the organization of this work was very much inferior in quality to the standard now required, and, while the price of that leather would average a little less, the price of each garment was at least 50 cents more than the average that has been paid since March. Furthermore, the quality of the leather is of a very much higher standard than what was formerly used.

Shearlings.—This section has had charge of the sheepskin shearlings required by the Ordnance Department for saddles, by the Signal Corps for aviators' boots, and also by the Quartermaster and other departments for coats. When the Government found it necessary to act, the prices of raw shearlings were the highest ever known, and by agreement with the live stock producers and raw stock dealers, arrangement was made to take the entire supply for 60 days at a very much reduced price. These shearlings are now being tanned under the direction of this section, and beginning August 1, 1918, will be shipped to the various departments which need them.

Horsehides.—A situation similar to that found in connection with the sheepskins for Army jerkins was found in connection with horsehides for Army gloves. After considerable experimenting, chrome tanned horsehide was found to be the strongest and most desirable leather for Army mittens and gloves. The authorization of the Quartermaster Department was found to be larger than the entire supply of horsehides. The shortage has been made up by a very good cowhide substitute, which is being used in the mittens only.

This situation made it necessary to control all of the horsehides produced. A statement under date of April 9, by the Acting Quartermaster General outlined the situation and declared that horsehides should not be sold for any other purpose than glove leather suitable for Army requirements. Since that date this section has obtained once a month from all dealers an inventory of their collections. It also obtains a weekly statement of their sales, and has full charge of the allocation of all horsehides.

Cowhide splits.—Having completed the control of horsehides for the benefit of the gloves and mittens, it was discovered that the cowhide split used in connection with the Army gloves and mittens was also very hard to obtain for the contractors. Split requirements in connection with the gloves call for several million feet, and a meeting was called of the cowhide tanners in Chicago on May 7, and an agreement was signed for three months, all tanners of cowhide splits agreeing to offer their splits first at a stated price to a contractor working on Government Army gloves and mittens. In this way the Army receives its supply first, and all other contract orders on splits at that time held by the tanners were put aside for the benefit of the Army.

Records and supervisions.—All Army glove manufacturers are advised whom to contract with for their leather, so as to eliminate, as far as possible, all unnecessary shipments by bringing western contractors in connection with the western tanners, and likewise in the East.

A system of supervision of raw stock being produced and leather being finished has been in force under the direction of this section from the beginning, and with the assistance of its field force the contractors are able to adjust any differences they may have with tanners without delay. Considerable work has been done in assisting the tanners in arranging for their schedules to be presented to the Price Fixing Committee. Results of these meetings have aided in the general policy of conservation and have already eliminated many unnecessary styles and grades.

HIDES AND SKIN.

The work of this section first began in earnest in April, when certain representative men of the hide, leather, packing, and cattle industries were called to Washington and told that in order to conserve shipping space import restrictions were necessary, which would keep out the big bulk of foreign hides and skins, and that it was deemed advisable to place maximum prices on all hides and skins.

Maximum prices were announced by the Price Fixing Committee May 1 on 600 to 700 different kinds of hides and skins (and the various grades of each kind as determined by this section), and the supervision of the schedule and the making of regulations and rules governing the importations, sales, and selections has devolved upon this section. There are 2,000 to 3,000 hide dealers and 600 to 700 tanners in this country who are affected by the price schedule and regulations. This section has asked 10 prominent hide dealers in various parts of the country each to organize in his section an association of hide dealers to cooperate with the Government and to try to improve conditions in the trade. Also, work has been begun with the Department of Agriculture, which has over 2,400 county agents, to improve the take-off and preparation of hides and to reduce the damage to hides by branding.

This section also takes part in agreements between the Allies as to hide prices and apportioning of quantities.

HARNESS, SADDLERY, AND LEATHER EQUIPMENT (EXCEPT SHOES).

As this section has only been organized a short time the results accomplished have not been very extensive.

One of its first endeavors was to acquaint the manufacturers of the existence of the section and its functions. This necessitated the

chief of the section making a trip to Chicago to attend the annual convention of the Wholesale Saddlery Association. As a result of this trip the section has received several appeals and the range of assistance seems unlimited. It embraces the hastening of contracts very much overdue, the nonreceipt of material, the long overdue unpaid balances, etc.

It had come to the section's notice that many manufacturers had not participated in war contracts. Letters to them brought varied replies. Most of them are anxious to assist to the full extent of their ability. Some considered their location too distant, but they have been assured that the cooperation of all is needed now.

In order that this section may have full information concerning production, labor capacity, etc., questionnaires are being sent out to all manufacturers throughout the country.

BOOTS AND SHOES.

This section officially took over the administration of the methods of conservation in the boot and shoe industry on May 28, 1918, the date of this report. On this date the Conservation Division submitted a proposed questionnaire for the spring season of 1919.

JUTE, HEMP, AND CORDAGE SECTION.

This section handles the following raw materials: Jute, manila, sisal, ixtle, New Zealand fiber, kapoc, coir yarn, animal and human hair, broom corn, straw, and cork; also the following finished products: Burlap, jute cordage, manila rope, sisal rope, kapoc mattresses, pillows and life preservers, cocoa mats and matting, linoleum, brooms, hair products and cork products. Surveys have been made of conditions in these industries.

Manila fiber is grown and produced only in the Philippine Islands. The supply investigation has proved adequate for all requirements of the United States and the Allies.

Rope machinery in the United States is being operated at full capacity, though under necessity the production could be practically doubled, because factories are operating only on a single day shift of 10 hours.

More than 75 per cent of the coir yarn imported into the United States from India is manufactured into mats and matting by two companies, and they were accordingly requested to send representatives for a conference on behalf of the whole industry. This conference had not, however, taken place at the date of this report.

MACHINE TOOL SECTION.

In the fall of 1917 this section, in order to obtain an idea of machine-tool production of the country, requested manufacturers for

shop schedules, giving their output in detail per month and indicating sold and unsold proportions of this output.

These figures were supplied for five months, from October to February, inclusive, and when tabulated under types and sizes indicated what machines were probably being produced in sufficient quantity, overproduced, and underproduced. This condition, of course, changed daily. No attempt has been made to keep a running inventory of machine-tool production.

As a result of the above inventory, it was possible to advise the War Trade Board as to modifications of their Conservation List, which had included machine tools. This permitted the export of such tools as were shown to be overproduced, the maintaining of which tools in this country, of course, imposed a hardship on the manufacturer. The utilization of machine tools held for shipment at seaports, some of which were for neutral and some for enemy countries, was also made possible by obtaining lists from various factories showing all shipments made in the past five months to countries other than England, France, Italy, and Japan. On this list were specified the selling and forwarding agents and the warehouses where the machine tools were stored. This list gave the Government a source of immediate supply for many tools urgently needed both here and by the Allies, and steps were taken to render such machines available for this purpose. The selling agents for these machines, as a rule, had contracts permitting them to sell only in those neutral or enemy countries to which they could not ship, but notwithstanding such contracts many machines were being released at high prices and dealt in by unscrupulous dealers, so that our Government, the Allied Governments, and American subcontractors frequently bought such machines at prices materially above those which should have been charged.

By an arrangement between this section and the War Department a plan was devised by which the commandeering power of the War Department was used in such a way as effectually to remedy this situation.

Requests were occasionally made to this section for information as to the number and types of machine tools required for the production of specified munitions. As a good deal of this work was new, no information was available in regard to proper machine-tool equipment.

This section secured for the Chief of Ordnance a number of experts in the use of machine tools, these experts making time studies of the various forms of munitions and arriving at a basis for determining machine tool needs for such munitions.

MANUFACTURERS' SCHEDULES.

In order to aid in properly grading priority for machine tools for both our own and the Allied programs, manufacturers were requested to furnish a schedule of their shop orders, specifying the dates when orders were placed, the grade of priority granted, and the date scheduled for shipment. With these lists in hand additional priority certificates could be more intelligently graded in order to ship machines in the order of their actual needs.

The section has requested the various departments to give information as to the different types of material on which machine tools would be used. When completed, this information, in conjunction with the time studies already referred to, will form an accurate basis for comparing machine-tool requirements and machine-tool production. The section has also recommended the establishment by the Army of a reserve of machine tools of the less easily procured types, and this recommendation has been approved.

A survey was made of available machine tools of the larger sizes, and it was sufficiently evident that some means must be taken to increase the available sources of supply. To this end, manufacturers were requested to submit lists of all the large machines they had manufactured for periods ranging from 10 to 20 years. All this information has been tabulated, and a complete record now exists of the location of every large machine tool that is in any sense modern, so that should commandeering from private plants become a necessity the machinery for such action is available.

New sources of supply for certain machine tools were opened up by the section, interesting concerns other than those manufacturing machine tools, and procuring for them patterns, drawings, and cooperation from the regular machine-tool makers; so that the Government departments were able to place contracts for quite a number of needed machines with concerns that have previously manufactured some articles of nonessential nature.

In addition, the section has a list of plants that may be used for the manufacture of machine tools, with itemized description of the equipment in their plant, these manufacturers being divided, geographically, into a series of districts. A number of such manufacturers have also submitted proposals for the production of certain machine tools, so that as soon as a shortage evidences itself their plants can also be utilized.

The chairman of the section was present at the convention of the National Machine Tool Builders' Association, held in Atlantic City on May 16-17, 1918, and there addressed the machine-tool manufacturers on the probable requirements of the Government for the future, outlining the types and sizes of machine tools on which they should

concentrate and specifying those sizes which were plentiful and on which less concentration was needed. The whole matter was very fully discussed at this convention, and as a result a committee was appointed by the president of the association, which committee has made investigations and certain recommendations tending toward an increase in production of the more needed machine tools.

The section, in conjunction with the Statistical Division, has sent out to the various machine-tool manufacturers questionnaires covering such points of importance as the dilution of labor, the turnover of labor, the reasons for delay in production, their ability to take on additional work, the consumption of pig iron, steel, coal, power, etc., the answers to which questionnaires have been tabulated and form a reasonably complete survey of the industry.

A card system is now in operation whereby the complete output of all the manufacturers of the more needed machine tools can be viewed, which index is kept up to date by the daily reports from the manufacturers showing when the machines are shipped to customers.

A committee was appointed by the Ordnance Department, consisting of three Ordnance officers and two members of the Machine Tool Section, to investigate the machine-tool requirements for the relining of cannon in France, which committee was to provide estimates of the number of the different sizes and types of machines required for this work, and to secure manufacturers who were able to undertake the work with promises of satisfactory results from the viewpoint of both product and delivery.

MILITARY OPTICAL GLASS AND INSTRUMENT SECTION.

This section was formed in March, 1918, to meet an urgent demand for a closer coordination of the optical instrument industry in this country, developing further work already done by various branches of the Council, the Bureau of Standards and other Government agencies. The requirements of the Army and Navy were mounting rapidly; to insure adequate production of the necessary fire-control and other instruments it was essential that a survey of the entire situation be made and that all nonessential work be eliminated and the entire energies of the optical manufacturers be devoted to optical munitions. The Optical Section accordingly requested manufacturers to report all orders for optical instruments for approval by the section before acceptance. Manufacturers realized the necessity for this request and have worked in harmony with the section. At the present time the optical-glass situation is well in hand; optical glass is distributed once a week by the section, and the plan is working satisfactorily.

A study has been made of the capacity of the different manufacturing plants and of the kinds of work best adapted to each factory.

Makers of spectacle lenses have been encouraged to undertake the manufacture of low-precision optical instruments; as a result, many firms who have never before made optical instruments are now beginning to produce such instruments for the Army and Navy.

A statistical study and comparison of the requirements, contracts, and deliveries of optical instruments for the Army has been prepared; also a report on the present status of the manufacture of optical munitions in this country. The present demand for optical instruments by the Army and Navy are many times larger than that of last year. Many million lenses and prisms are required in these instruments. New manufacturing capacity is being developed to keep pace with the increased demand. If properly controlled, there is no reason for apprehension that the manufacturers of optical instruments in this country will not be able to take care of the very large requirements of the military forces. To accomplish this it is essential, however, to follow the industry closely and to keep it running at high efficiency, and this is primarily the function of this section.

SUPPLIES SECTION.

The Supplies Section of the War Industries Board was formed at the time when the majority of the members of the Committee on Supplies of the Council of National Defense were transferred to the Quartermaster Corps of the Army. To this section were attached representatives from the office of the Quartermaster General, who devoted part of their time to the War Industries Board in connection with knit goods, linen thread, rubber goods, and felts, etc. The section was a temporary expedient to represent the War Industries Board with regard to textiles until a more elaborate organization should be worked out, which was in contemplation at the date of this report.

TOBACCO SECTION.

On April 26 Mr. A. I. Esberg was requested to undertake the work of organizing a Tobacco Section. From then until the end of May the following have been the principal activities of this section:

The organization and meetings of the Tobacco Section, the province of which covered the various governmental and allied purchases and the entire range of requirements, price bases, type bases of purchase, distribution of orders, etc.

Consultation with the purchasing agents of the countries associated with the United States in the war and developing and adjusting their requirements.

Initiating steps toward a survey of the producing facilities of the industry and the state of the raw material markets and stocks.

Organization of advisory committees.

Establishing contact with other governmental agencies concerned in tobacco problems, namely, the War Trade Board, the Shipping Board, etc.

STORED MATERIALS DIVISION.

In December, 1917, it became evident to the War Industries Board that a systematic effort should be made to secure an inventory of the large quantity of supplies, many of them war essentials, held in storage in the United States awaiting export.

It was realized that the information thereby secured by one special agency would bring about valuable economy in time for the various purchasing agencies of the United States Government and of the allies. Accordingly, in January, 1918, the Stored Materials Division was established. Information as to the character, quantity, and owners of stored commodities is transmitted for commandeering purposes to the various branches of the Federal Government and to the divisions of the War Industries Board, in accordance with their needs and requests.

The sources of the information thus obtained are the various Government intelligence channels, fire insurance companies, Federal reserve banks, exporters, shipping agents, and manufacturers.

While primarily the scope of the work was intended to cover the one purpose set forth, much information of value to other Government war organizations has developed, referring particularly to those concerned with commodities stored in the United States, awaiting export to consignees whose names appear in the enemy-trading list or in the black lists of the allied Governments.

STORAGE COMMITTEE.

The Storage Committee's field lies in planning and advising as to that group of activities affecting the movement of munitions and supplies of war from the point at which they are manufactured to the point at which they are utilized, either in this country or overseas.

The policy of the committee has been to cooperate with every agency of the Government, military or civil, having such problems. This cooperation has been always of an advisory and supplemental character, with one exception, the explanation and description of which is given later in this report.

In accordance with the above policy, steps were taken to investigate and advise upon:

(a) The character and magnitude of the storage problems confronting the Army.

(b) The status of shipping and transportation facilities affecting storage problems, both in the interior and at ports.

(c) The consolidated use of given areas by the five branches of the military service and the relative location of the chain of storage areas.

(d) The shipping ports at or in the vicinity of which terminal areas should be provided.

(e) The locations of terminal storage areas at shipping ports.

(f) The scope of each terminal port area and how it should be developed.

As a result of careful investigation, definite recommendations were made for the establishment, either by lease or purchase, of storage areas at the ports of New York, Philadelphia, Baltimore, Norfolk, Newport News, and Charleston.

As the effectiveness and successful use of the recommended areas and facilities in this country depend primarily upon the terminal port or ports abroad having proper storage areas and efficient operating organizations, certain specific recommendations were made, for consideration, to provide a coordinated storage scheme throughout the military organization. It is self-evident that if it is possible to reduce the time a vessel consumes in a round trip by one-third, the effort is equivalent to having delivered and put into service one-half more tonnage. As a part of this scheme a general recommendation was made for the establishment of storage areas in the interior of the United States at or near manufacturing centers to facilitate the movement of freight by carloads and trainloads rather than by less-than-carload lots, thereby securing the fullest use of transportation facilities.

[STORAGE AT CANTONMENTS.]

The storage problem at cantonments was considered and specific recommendations were made as to the amount, character, and location at each in view of the character, types, and quantity of the different supplies to be stored.

In July, 1917, as a result of the investigations made, it was apparent that an expenditure in excess of \$50,000,000 would be required for terminal storage areas alone which would cover probably 2,000 acres. Subsequently it became necessary to increase these estimates materially, due principally to the enlarged military program.

The enlarged military program and the congestion of transportation at the ports above mentioned required further increased port terminal facilities, so surveys were made of the storage, transportation, and shipping facilities of the South Atlantic and Gulf ports.

The study of methods of packing and stowing were continued and the results issued in bulletin form for distribution. The repeated inquiries for this information have been widespread and indicate how useful and helpful these bulletins are, not only to the Government departments but to industry and educational institutions. Of the *many* opportunities for conservation of space and transportation

facilities and for increasing the efficiency of an industry there is undoubtedly not one that offers greater possibilities of improvement than in the methods employed in baling American cotton.

In cooperation with the War Department, studies were made resulting in a recommendation to the Director General of Railroads for an adjustment of freight rates, based upon a full carloading, which the committee considered would not only encourage the proper methods of baling, thereby creating a vast saving to transportation and reduce wastefulness in the industry but would create increased revenue to the railroads and permit the gradual amortizing of the investment in the existing recompress plants. It is indisputable that American cotton-baling methods generally are the most obsolete of any country in the world and can be termed a disgrace.

Foreseeing some of the problems that the draft and increased production would place upon industry, an investigation was made as to the possibility of dilution of labor with women, particularly their use in warehouses. In connection with this same subject of labor and in view of the urgent necessity for a prompt increase in the volume of production through which the safeguards with which the people of this country have sought to protect labor might be unwisely and unnecessarily broken down, certain standards of employment were suggested and adopted and issued by the Ordnance Department and Quartermaster Corps. It was realized that these safeguards for the most part are mechanisms of efficiency. Industrial history proves that reasonable hours, fair working conditions, and a proper wage scale are essential to high production.

[EMPLOYMENT MANAGEMENT.]

The one exception previously mentioned in the policy of the storage committee referred to the question of employment management.

Early in 1918, at the request of the Industrial Service Sections of the Ordnance Department, Quartermaster Corps, and the Emergency Fleet Corporation, this committee, in conjunction with representatives of the above-mentioned departments and the Department of Labor, undertook to establish intensive courses for training employment managers connected with plants engaged in Government work.

These courses have been established at the University of Rochester, Harvard, Columbia, Pittsburgh, and plans have been completed for one at the University of California and one at the University of Washington. Men and women are eligible provided they meet the rather strict requirements for admission. The policy governing these courses requires that the quality of personnel receives first consideration rather than the quantity of graduates. This is a prime requisite because the decisions of one employment manager very often affect many thousands of workers.

For those who have not had the requisite industrial experience, an intensive preliminary course has been established which furnishes

that training necessary for eligibility in the course on employment management.

The personnel section has continued its work with increasing usefulness to the War and Navy Departments locating upon request men, and in some cases women, especially qualified with technical experience and knowledge for service in the several branches of the Government. The courses for storekeepers established at 15 leading American colleges and universities were continued in some cases for nearly a year and with great success. As the several staff corps of the Army developed their own training agencies these schools were absorbed or discontinued. Two or three thousand students recruited on account of specialized knowledge of warehousing methods were given an intensive eight weeks of training.

With the reorganization of the General Staff under General Order No. 14, and the creation of the department of purchases, storage, and traffic, most of the agencies through which the storage committee operated were practically absorbed by the regular organization of the Army, and during the last few months of the fiscal year, under the leadership of Mr. James Inglis, the work had more and more to do with civilian storage activities. A great deal of propaganda work among manufacturers, looking toward the minimizing of less-than-carload shipments and the encouragement of train-load shipments, has been carried on.

COMMITTEE ON PRODUCTION.

(Later the Production Division.)

The Committee on Production was created September 20, 1917, with Mr. S. M. Vauclain as chairman, its purpose being designated in the notice of appointment, which read as follows:

Mr. S. M. Vauclain is hereby appointed a Committee on Production under the supervision of Mr. Brookings, to represent the War Industries Board in the distribution and the placing of orders and in the assisting of the military and naval departments of the Government in the production of guns, gun forgings, shell forgings, shafting, and other forgings and forge stock material, in order that no conflict in requirements will result, that the capacity of the various plants will be fully utilized, that the maximum production will be assured, and that new facilities will be created where necessary. Mr. Vauclain is authorized to associate with him such agents as he may from time to time consider necessary to carry on the work efficiently. He will associate himself with the various departments of the Government in such a manner as to accomplish the purpose indicated above. It is the sense of the War Industries Board that the placing of all orders for contracts in the above list should be referred to this committee before final negotiations are entered into with the manufacturers.

Owing to the broad scope of the duties of the committee, the work has been varied, dealing with contracts, plants, specifications, inspec-

tion, locomotives, cars, railroad gun mounts for the Army, railroad gun mounts for the Navy, priorities, fuel-exemption orders, new plant creations, plant extensions, change in management of plants, forgings, ordnance, shells, plant inspection, progress reports, standardization of locomotives and cars for the use of the United States Government at home and in France, the arranging of an expert mechanical and railroad force to be sent to Russia.

This staff of competent engineers and mechanical experts accompanied the United States Railroad Expeditionary Force. Much was accomplished at Vladivostok in the way of laying out yards, building shops, and equipping them. This work was stopped before completion owing to revolutionary conditions existing in Russia and the force was returned to the United States. Matters are in such shape that should conditions change in Russia and this force be again required it could at once be reassembled and utilized.

A similar force was arranged for by the committee and sent to France for the handling of both car and locomotive equipment upon arrival in that country.

The Director General of Railroads, on February 8, 1918, requested the committee, in company with practical, experienced freight-car builders and such other associates as were deemed necessary, to provide for immediate consideration and recommendation plans and specifications for the standardization of freight-car equipment for use in the United States in the following letter:

I would be pleased if you would create a committee of practical experienced freight-car builders, with such other associates as you deem proper, for the purpose of giving immediate consideration to and recommendation upon plans and specifications for the following:

- (a) 40 and 50 ton box car, 40 feet 6 inches inside;
- (b) 55 and 70 ton hopper-bottom coal car;
- (c) 50-ton flat-bottom gondola car.

It is requested that these plans shall comprise the most approved and modern design of car, not only as to its structural strength but having in mind the important questions of (a) original cost, (b) maintenance cost in road service, and to be such as to permit the entry of any improved or better designs than these prescribed in said specifications.

The details of the work necessary were outlined with the mechanical engineers who formed the necessary organization for producing plans and specifications as desired by the Director General of Railroads. This has all been accomplished without cost to the Government.

The Director General of Railroads, on February 13, 1918, wrote as follows:

I would be pleased if you would suggest a committee of practical experienced locomotive builders for the selection of not more than 12 types of standard locomotives of different weights and tractive power, to be submitted to me next Wednesday, the 20th instant, for consideration in my intention to reduce

to a proper minimum the classes of locomotives to be ordered for the railroads of the United States operated under the orders of the Director General of Railroads.

It is requested that you give consideration also to creating standards of those parts subject to wear and frequent replacement, such as cylinders, cylinder heads, valves, valve gear, crossheads, rods, crank pins, axles, driving boxes, and other similar parts, so that these may, as far as economy and efficiency will permit, be made standard for as many types as possible, and so as to permit entry of improved or better designed parts in the future.

After meetings of executives of the several locomotive companies, the details of the work necessary were outlined with the mechanical engineers who formed the necessary organization for producing plans and specifications as desired by the Director General of Railroads. This also has been accomplished without cost to the Government.

COMMITTEE ON EMERGENCY CONSTRUCTION.

Since the last annual report, which covered the activities of the Committee on Emergency Construction up to June 30, 1917, the committee has developed along the lines originally laid down for it and continues to function in the War Industries Board in cooperation with the Construction Division of the Army. The last report indicated a study of the Army's building program, the main feature of which at that time was the building of the cantonments. Early investigation indicated that practically all of the Government's building program would be conducted under the same general conditions; namely, that the projects would arise quickly and unexpectedly; that they would have to start almost immediately after they were decided upon; that preliminary estimates were in almost every case out of the question; that in order to make a quick start the Government and the contractor would have to move into the field together, there to develop the work; that the appropriations dealt with lump sums arrived at after a most casual and swift survey of the requirements, and that the Government's safety lay in bringing to its aid the strong and experienced building organizations of the country. Accordingly, the Government's policy in pursuing its building program supported itself on three fundamentals:

- (1) A strong administrative and supervisory organization.
- (2) An elastic form of contract which, while suitably compensating the contractor, should not attempt to unload upon him the risks incident to the indecision and haste of the Government's predicament; in other words, that the Government should carry its own risk.
- (3) The employment of contractors of suitable integrity, experience, and going organization.

The whole Army building program has been continued on the fundamentals first laid down and the work for the period covered

by this report, involving about \$300,000,000 worth of construction carried out under about 250 contracts, has all sustained the wisdom of the policy first laid down.

As formerly reported, the form of organization for the Construction Division was recommended by this committee and the War Department followed the recommendation in setting up the Construction Division.

The period of the building of the cantonments (June to October) was occupied largely by the committee in watching over the activities of the Construction Division in all matters pertaining to the administration of the contract; interpretation, rulings, etc., concerning the contract. The committee was also engaged in making recommendations to other branches of the service, for at that time many branches of the Army were conducting their own building departments.

[CONSULTATION ON DESIGN.]

In the matter of the design and layout of the cantonments, while the committee took only an advisory part, the services of expert engineers were made available to the Construction Division, the type of structures was changed from one-story to two-story, effecting great savings in construction. Eminent engineers who gave their services were summoned to Washington to consult in matters of water supply, sewage, drainage, road construction, etc.

The work on the cantonments developed the need of further changes in the organization of the Construction Division, and, commencing about September, 1917, the committee spent much of its time in conferences looking toward the reorganization of that division. Also, the question of interferences between the various departments of the Army in conducting building operations became a matter of serious consideration. The outcome was that by order of October 5, 1917, the Adjutant General directed that all construction work in this country for the Army be handled by the Construction Division.

The committee has also given much time to conferences with various departments engaged in the housing problem. A member of the committee is also connected with the Division of Housing and Transportation of the Department of Labor, and, while the committee as a group is not now being consulted on the subject of housing, it has in the past given much time to it.

At the end of the year 1917 the committee made a study of the working of the standard form of cantonment contract. It was discovered that, while the average percentage paid contractors for the work performed up to that date was only 4½ per cent, nevertheless the compensation to the contractors contained many inequalities. The War Industries Board was addressed, suggesting the lowering of percentage, and, after much discussion, on January 25, 1918, the War

Industries Board forwarded to the Construction Division the recommendation of this committee, duly approved, that the scale of percentages to be paid contractors be modified. The original form of contract provided that on small work a fee of 10 per cent be paid, as the work increased, the fee diminished to 6 per cent and remained at that point until a fee of \$250,000 had been earned, which sum was provided as a maximum limit to the fee. The revised form provided that the highest percentage should be 7 per cent, this scale decreasing as the volume of work increased, until $2\frac{1}{2}$ per cent was reached; the maximum fee of \$250,000 remained. This new form of contract has been in operation since its approval by the War Industries Board, and, in view of the fact that the contractor is not allowed to charge any part of his overhead expense to the cost of Government work, it has caused the contractors to do the work at a very narrow margin of profit. Nevertheless, they have responded patriotically to the lower scale of percentages, and it can be said that the new form, as now used, is equitable and satisfactory.

To summarize: The committee has assisted in the organization of the construction division, has developed the emergency form of contract, the survey of the contracting industry, the design of the cantonments, and has furnished the center for dissemination of all information concerning the Army building program. It has crystallized and unified the Government's building methods in so far as the Army is concerned, and has brought practically all of its various building activities under one head. It has contributed largely to the setting up of the construction division as a separate and modern institution capable of handling the whole Government building program by proper business methods. It has taken part in the organization of many of the War Industries Board's sections, such as hollow tile, plumbing supplies, sprinklers, cement, lumber, etc., and has been the medium of cooperation between these sections and the construction division.

The committee neither prepares plans nor approves plans made by others; it makes no estimates; it does not pass upon units of cost, all of which things are done by the construction division. It advises concerning contractors, but does not make contracts. It has nothing to do with the selection of architects. It has, however, attempted to formulate a proper contract to be used with architects and engineers. It takes no part in the selection of building materials or in the selection or approval of sites, although at the time the cantonments were up for consideration the committee mobilized city planners throughout the country and prepared them to cooperate with the various department commanders charged with selecting the sites.

LEGAL SECTION.

When the General Munitions Board was created in May, 1917, under the authority of the Council of National Defense, a Legal Committee was formed under the chairmanship of Hon. R. J. Bulkley. At this time the departments of the Army, for which the board acted in an advisory capacity, were faced with the necessity of placing immediate contracts for supplies and construction. The first task of the Legal Committee, therefore, was the drafting of contracts, such as the standard forms used for cantonment construction, surgical dressings, and medical beds. Subsequently, in August and September, 1917, the board loaned the services of the committee to the Emergency Fleet Corporation, which was at that time without a legal staff of its own.

Upon the creation of the War Industries Board to succeed the General Munitions Board the latter's Legal Committee became the former's Legal Section, with an increased personnel. Its activities have included such matters as the following: Memoranda and opinions regarding the Government's rights and liabilities under existing law, the legality of suggested procedure, the legalization needed for the more effective prosecution of the war.

The demands made upon the Legal Section have been constant and of the most varied nature. Thus it was at one time necessary to enter into extended negotiations to avert threatened litigation by parties whose contracts had been displaced by Government orders.

The chief of the Legal Section has been one of the representatives of the Government in the control and regulation of hydraulic and electrical power at various points throughout the United States, and the work of drafting and urging the passage of emergency legislation to meet war needs in this field and of meeting the many legal problems arising out of the extensive interests of the Government in the production and distribution of power has devolved upon him and his staff.

FIRE PREVENTION SECTION.

This section was organized on April 5, 1918, taking over the work carried on for many months by the National Board of Fire Underwriters, acting in cooperation with the Council of National Defense. It has made complete new inspections of the larger munition plants of the country, continuous operation of which is essential to the war program, and whose qualities as fire risks are reported to be "poor" to "bad," and has issued reports with specifications for improvements on 83 such plants.

These reports have been followed up through War and Navy channels; a result of which improvements are reported completed

or in progress on 11 plants covered in the 15 reports sent out between April 11 and April 28. These improvements include: Extension of sprinkler protection; extension of yard pipe, hydrant, and hose systems; increase in water supplies; storage safeguards; fire cut-offs; additions to watch services; additional first-aid appliances; improvement in electric wiring; protection for openings in fire walls; substitution of metal for wooden partitions, cupboards, and lockers; enforcement of rules prohibiting smoking; new for old sprinklers, and improved housekeeping.

Reports on 15 additional plants are at present in progress and reports on 87 additional plants have been ordered.

The following matters of policy have been taken up by the section:

Fire-prevention clauses for Government contracts.

A definition of Government policy in respect to financing improvements for fire protection.

INLAND TRAFFIC SECTION.

Although the War and Navy Departments, the Emergency Fleet Corporation, and the Food and Fuel Administrations all have traffic organizations, there was found to be a demand for some other organization to which manufacturers and shippers, whose products were of importance from the point of view of the prosecution of the war but who were unable to establish a direct connection with any one of the above Government agencies, could turn for assistance.

The Inland Traffic Section was created to satisfy this demand, but its functions have been materially increased since its creation and may now be described as follows:

(a) To point out to shippers and consignees the proper source through which to secure assistance and relief when necessary.

(b) To assist all departments of the Government and the Railroad Administration in preventing congestion, eliminating unnecessary transportation, and by personal conference between the chief of the section and the manufacturers to secure the latter's cooperation.

(c) To relieve the general officers of the Railroad Administration of certain details that otherwise would burden them.

(d) To fill in the gaps not covered by any other transportation organization.

In order to assist in the movement of traffic under war conditions the section has requested manufacturers to draw up a chart or flow sheet which, in diagrammatic form, illustrates their needs as to the assembling of raw material and the distribution of their finished products. These diagrams have been distributed to the interested railroad officials and have proved to be valuable for the purpose of improving traffic movement.

AGENCIES OF THE COUNCIL OF NATIONAL DEFENSE DISSOLVED OR TRANSFERRED TO OTHER JURISDICTION DURING THE FISCAL YEAR.

COMMERCIAL ECONOMY BOARD.

(From May 9 the Conservation Division of the War Industries Board.)

It was obvious at the beginning of the war that an enormous fund of resources would have to be released from our ordinary commercial and industrial activities in order to provide for war needs, and the fundamental object of the Commercial Economy Board has been to determine by careful investigation what less essential uses of labor, material, equipment, and capital can be dispensed with in time of war. The board early came to the conclusion that at least in the first stages of business readjustment it would be far more practical to eliminate the wasteful or unnecessary uses of labor, material, equipment, and capital in all kinds of business rather than to have certain businesses classed as nonessential. Although it was realized that in some cases a shortage of raw material or transportation might become so severe as to call for drastic action, it appeared that as a rule each industry and trade could eliminate enough less essential uses of our resources and facilities to provide for the Government's requirements.

By the application of this plan wherever possible an industry could maintain at least the nucleus of its organization, retain its essential trade connections, and protect valuable business rights such as trade-marks, which would have been sacrificed by a categorical classification stigmatizing a particular industry as nonessential and shutting it down entirely. This plan of conservation through industrial and commercial economies, furthermore, helps to prevent shocks to our credit structure and to avoid severe and sudden labor dislocations such as inevitably occur when conditions become so acute that an entire industry must be closed. Proceeding upon this plan, the Commercial Economy Board tried to foresee conditions that needed to be met in order to deal with them forehandedly, so that there would be as little injury as possible to business and to the people of the country.

The board undertook to adjust its plans according to the needs of the Government for essential materials, for manufacturing capacity, and for shipping space, and also according to the essential requirements of the civilian population, readjusting its program as condi-

tions changed. In its regular course of procedure with each subject the board undertook to make a careful preliminary investigation, securing all the information available from other Government departments, to hold conferences with representatives of the trade, to submit the important questions to every firm in the business for their advice, and then to make such supplementary inquiries as seemed necessary to clear up doubtful points. After its recommendations had been formulated and approved by the Council of National Defense, they were sent out to all the industries and trades affected. Plans were then worked out for securing full cooperation. Although the board, of course, had no power to compel observance of its recommendations by process of law, it has been able to secure the desired results through voluntary cooperation of business men. The success of this plan has been due in large measure to the policy of consulting in advance all who are interested in the proposed plans, including not only manufacturers but also wholesalers and retailers. By bringing these business men together to carry out cooperative plans of readjustment we believe that the spirit of national unity has been strengthened and the Government thereby aided in expediting the prosecution of the war.

RETURNS OF UNSOLD BREAD.

As stated in the report for the year ending June 30, 1917, the recommendations for the elimination of the return of unsold bread to bakers had been generally adopted. These recommendations took effect finally on July 10, 1917, and were adopted on or before that date by practically every wholesale baker in the country.

In supervising the administration of this plan the board worked closely with the Food Administration, and in September these recommendations were incorporated by the Food Administration in its rules for the license of bakers. At that time the board transferred to the Food Administration entire supervision of this matter. In announcing its program the Food Administration estimated that the elimination of bread returns was resulting in a saving of 600,000 barrels of flour per year.

DELIVERY SERVICE.

The board continued its investigations of means for securing economy in the delivery service of retail stores. Agents were sent out to gather first-hand information regarding the organization and the operation of cooperative delivery systems in towns where they have been established, and also to study methods of routing and management of delivery departments in large retail stores. Especial attention was also given to the results accomplished in stores which had restricted their delivery service in accordance with the board's rec-

ommendations. The results of these investigations were published in a pamphlet issued in April, 1918.

Experience has shown that these plans have resulted in substantial savings, and thereby facilitated the readjustment of retail business to war conditions. For example, 34 department stores in different cities by restricting their service to one delivery a day over each route have been able to operate with 554 deliverymen where 864 were previously employed. This is a saving of 35 per cent. These same stores have saved 132 automobiles out of 330, or 40 per cent. By restricting the privilege of returning merchandise to three days the quantity returned has been reduced 36 per cent. These merchants have also found it possible to carry on their business with fewer men in their sorting and routing rooms. In small stores one delivery a day on each route in many cases enabled one deliveryman to do the work that formerly required two. Thirteen stores in a large city in the Middle West have saved the services of 151 men. In another city one retail grocer now employs 28 deliverymen in the place of 57, and has saved 24 horses and wagons out of 46. Another has saved 32 wagons and drivers out of 65. Forty-two small grocers in a number of towns in an Eastern State found that 61 deliverymen could do the work for which 116 were previously employed. Six retail stores in a Texas town of 10,000 inhabitants organized a cooperative delivery system and found that instead of 6 trucks and 6 men that they had required when each store maintained its own delivery service only 1 truck and 1 man were needed. These are typical instances.

The general adoption of these recommendations, therefore, has made it possible for a large number of retail merchants to operate with smaller forces, as their employees have been called into military service or have engaged in essential war work. Some of the larger cities in which these plans have been adopted are Boston, Providence, Philadelphia, Washington, Lynchburg, Louisville, Cincinnati, Cleveland, Columbus, Indianapolis, Detroit, Milwaukee, St. Paul, Minnesota, Des Moines, St. Louis, Seattle, Los Angeles, and Oakland, as well as many other cities and towns of smaller size. The number of cities in which the recommendations have been put into effect has been constantly increasing and it is expected that as war conditions make it more and more necessary, practically universal adoption will be secured.

WOOL.

The conservation of wool is a subject to which the board has given a great deal of attention during the year. This was one of the most complicated problems with which the board had to deal. Large quantities of wool are needed for equipping our fighting forces. More than one-half of the wool that we normally manufacture in this

country is imported in ships. Our wool-manufacturing capacity, furthermore, is limited. Under these circumstances it was early apparent to the board that economy in the use of wool would be necessary. The action of the board in requesting wool manufacturers to reduce the number of designs that they manufactured was explained in the report for the preceding year.

MEN'S AND BOYS' CLOTHING.

On July 17, 1917, the board issued recommendations to all manufacturers of men's clothing that for the spring season of 1918 they should avoid excessive multiplicity of styles, confining themselves to the number of models actually required by the trade, and that they should also avoid models using cloth for needless adornments such as belts on coats, pleats, and similar features. These recommendations were taken up with the wholesale clothiers, wholesale tailors, merchant tailors, fashion-plate houses, mail-order houses, cut, make, and trim houses, importers, retailers, and all others interested in this trade. After numerous conferences and thorough discussion of the subject with all branches of the industry the program was finally adopted by the entire industry and practically 100 per cent cooperation was secured.

Supplementary recommendations were issued on September 24 regarding the use of substitutes for virgin wool and additional recommendations were put out from time to time to special branches of the industry, such as mackinaw trade.

For the fall season of 1918 a much longer list of detailed recommendations were issued on January 23 whereby the savings of cloth were substantially increased. Similar recommendations were issued to the manufacturers of boys' clothing. These have been universally carried out.

One of the substantial savings brought about was through a reduction in the size of sample swatches. By restricting their samples to a maximum of 6 by 9 inches the wholesale tailors, for example, were able to save 450,000 yards of cloth. The adoption of similar restrictions on the size of sample swatches by the other branches of the clothing industry has resulted in savings of upward of 3,000,000 yards of cloth. The size of these swatches had been increased through competition and in order to gain a temporary competitive advantage in individual instances. The restrictions on the size of samples cut out an absolute waste which involved no hardship on anyone. This was one of the minor savings in this program of wool conservation.

In the men's clothing industry from 12 to 15 per cent of the quantity of cloth per garment has been eliminated without involving any

hardship on the consumer and it has been possible to make a large number of garments out of the available stocks of cloth.

WOMEN'S GARMENTS.

Manufacturers of women's garments were requested similarly to economize in every practical way in the quantity of cloth used in their industry. Numerous conferences were held with the garment manufacturers, dressmakers, retailers, fashion magazines, and importers. In view of the influence of the Paris garment makers on styles, their cooperation was enlisted through the French Government. They agreed to restrict the yardage used in garments to be made for the American market to a maximum of $4\frac{1}{2}$ meters. This represented a reduction of about 25 per cent from the styles then current.

With the cooperation of all branches of the industry, plans were put into effect whereby the unnecessary use of cloth was eliminated with a resulting saving of from 20 to 25 per cent in the quantity of cloth used per garment. As in the case of men's clothing, this involved no hardship on the part of the consumer and made it possible to produce a correspondingly larger number of garments from the quantity of cloth available for civilian purposes.

LEATHER.

As a result of the investigations that had been made in the two preceding months, recommendations were issued on July 26 to shoe manufacturers for the spring season of 1918 requesting them to reduce the number of styles that they were making and to eliminate those styles that were particularly wasteful. As a result of this recommendation practically every shoe manufacturer in the country made a reduction in the number of styles that he was offering. In many instances this reduction amounted to 50 per cent and in some cases to 60 per cent.

In November the board began the definite formation of its recommendations for shoe manufacturers for the fall season of 1918. General recommendations were issued to the shoe manufacturers on December 21 requesting them to reduce still further, if possible, the necessary use of materials and capital. At the same time a list of specific suggestions were submitted to the trade in order to obtain their opinion regarding their practicability. These suggestions had been placed before the board by members of the shoe trade at various times during the preceding six months. As a result of this inquiry specific recommendations were issued January 17 regarding the maximum height of women's, children's, and misses' shoes, and also for the restriction of men's and women's shoes to certain specified colors.

In working out these programs for conservation in the shoe industry, the board was assisted by the Council of National Service of the Shoe and Leather Industry, which was made up of representatives of each branch of the industry, including tanners, last manufacturers, cut-sole manufacturers, morocco leather manufacturers, shoe manufacturers, wholesalers, and retailers. In this industry, also, the board received practically complete cooperation from the industry.

In preparing and making effective its recommendations in both the clothing and in the shoe industry, the board found it necessary to exercise especial caution because of the long period which elapses—eight or nine months—between the time when the manufacturers prepare their samples and the date when the goods are offered to the public by retailers. Merchandise of this sort in which style is so predominant is frequently rendered worthless by a change of fashion. The adoption of the recommendations of the Commercial Economy Board amounted to a change of style and it was obviously necessary to put this into effect without rendering worthless stocks of merchandise already manufactured and in the hands of merchants throughout the country. This was worked out with the cooperation of these industries.

PAINT AND VARNISH.

A plan for conservation in the paint industry was worked out with the assistance of the War Service Committees of the Paint and Varnish Manufacturing Industries. The investigation that was made in this connection showed that each manufacturer was putting out from 40 to over 100 shades of house paint and a similarly wide variety of other kinds of paint and varnish. New shades had been added from time to time in order to obtain a temporary competitive advantage. It appeared that a substantial reduction in the number of shades of paint could be effected without injury to anyone. Consequently, recommendations were issued on January 21 that on and after July 1, 1918, each paint manufacturer should restrict his product to 32 shades of house paint, 10 grades of architectural varnish, and so on, for all the other products. It was also recommended that the manufacturers should eliminate half-gallon cans, all cans smaller than half pints, and certain other sizes in individual lines of product.

By means of these recommendations economy is secured in the manufacture of paint and what is most important, the quantity of essential materials, such as linseed oil and tinplate, tied up in manufacturers' and dealers' stocks throughout the country will be cut down by at least 25 per cent. Their stocks will be made more mobile, and capital will be released to aid in financing the war.

AUTOMOBILE TIRES.

On April 18 the board requested the War Service Committee of the Rubber Industry to draw up a tentative program of conservation which the board could use as a basis for the formulation of definite plans. About three-fourths of the rubber imported into the country is used in the manufacture of automobile tires, and therefore economy in that branch of the rubber industry was of the greatest importance. The committee, after careful investigation, submitted a report for the standardization of automobile pneumatic tires whereby the number of sizes and types is to be reduced from 287 to 32 immediately, and by gradual steps during the next two years to 9 sizes and types. This will result in economy in production and make a large reduction in the quantity of inactive stocks in the hands of manufacturers and dealers. The types and sizes that are being eliminated are those for which there is very little demand and which can not be considered essential in time of war.

TIN.

The world's production of pig tin was roughly 120,000 tons in 1917. The output has been fairly stationary around this point for several years. Consequently there is little likelihood that larger quantities will become available. Out of this total the United States consumed roughly 70,000 tons in 1917, and owing to the demands from other countries and difficulties in ocean shipping there appeared to be no likelihood that the supplies available for this country could be increased to any extent. At the same time the war program called for a considerable quantity of tin. Under these circumstances economy in its use was obviously necessary. The board therefore held conferences with all the tin-using industries, including manufacturers of solder, babbitt metal, white metal, bronze castings and ingots, collapsible tubes, tinfoil, silver-plated hollow ware, and silk dyers. Through these conferences and further investigations conducted by the Bureau of Standards, plans were worked out whereby a saving could be made of approximately 30 per cent of the quantity of tin normally used.

OTHER MEASURES OF CONSERVATION.

In addition to the plans of conservation in the industries specified above, the board made investigations in numerous other industries, such as jute, cotton, silk, hat and cap manufacture, and others. Some of these investigations are resulting in the development of comprehensive programs of conservation.

Another subject to which attention was given was the reduction in the number of trunks carried by traveling salesmen employed by dry goods wholesalers. Recommendations on this subject were being

considered at the time of the completion of this report. The purpose of this plan was to reduce the amount of baggage the railroads were called upon to handle.

In December a conference was held with a group of representative automobile dealers. At the suggestion of the board the War Service Committee of Automobile Dealers drew up a program for economy in their trade. The determination of the program and its execution were left to the War Service Committee which has reported that through the adoption of their plans they expect to release at least 30,000 mechanics for more essential work.

TRANSFER TO THE WAR INDUSTRIES BOARD.

On May 9, 1918, the work of the Commercial Economy Board was transferred to the Conservation Division of the War Industries Board. Mr. A. W. Shaw, chairman of the Commercial Economy Board, became the chairman of the Conservation Division. The function of the Conservation Division was defined as "the studious conservation of resources and facilities by means of scientific, commercial, and industrial economies."

DIVISION OF STATISTICS.

(Transferred in part to the General Staff of the Army, in part to the War Industries Board.)

During the first two weeks of the war an important piece of statistical work was done in tabulating the output of all munitions factories and mapping the locations by types of products. Organization studies and office systematization then occupied a greater part of the division's time, and statistical work as a major occupation of the division was not again undertaken until early in July, the beginning of the period covered by this report.

The five supply bureaus of the Army had early let contracts for Army materials, but it was not until the first deliveries began to come in that questions concerning requirements, size of orders, and rates of deliveries commenced to demand attention. Early in July heavy pressure was brought to bear on the War Department in favor of immediately calling the first draft of selected men, but decisions as to how many should be called and when depended largely upon the rate at which cantonments were being constructed and clothing and equipment secured. The first consecutive statistical reports issued by the Division of Statistics of the council dealt with the initial equipment of troops and were designed to help answer the question, "When will it be possible to call the draft army?"

It was not enough to present these figures once or twice. Questions were constantly arising which depended for their solution upon

reports on the progress of material procurement to date. From the 1st of July until the middle of August the division issued a series of brief reports based upon the meager figures which were available. It was difficult at first to obtain adequate data concerning the progress of war orders, because as yet little machinery existed in the different supply bureaus for securing reports from manufacturers or for compiling the returns once they were secured. Moreover, since the Council of National Defense held a somewhat indefinite official relationship to the War and Navy Departments, there were no natural channels through which information would automatically flow. For many weeks nearly all the data upon which to base the periodic statistical reports were secured through personal interviews and daily visits to offices within the various supply bureaus.

Until the middle of the summer the Division of Statistics had occupied a more or less independent position, securing information for first one office and then another as occasion arose. On August 17, however, the War Industries Board passed a resolution requesting the Director of the Council to organize the statistical work on an enlarged scale so as to provide for the assembling of information valuable to the Priorities Committee, the Purchasing Commission, and other branches of the Council. This was the first important step in the gradual change of the Division of Statistics from a volunteer civilian organization to the central statistical bureau of the War Department.

On September 19 the Secretary of War signed an order instructing the chief of each of the five supply bureaus of the Army to furnish or make available statistical information to the Council of National Defense as to war-industry requirements. The order provided that each bureau should appoint an officer to act as liaison officer between the Army departments and the Division of Statistics.

Beginning early in October, a series of special reports was made for the General Staff. On January 26 the Division was given an office in the War Department and began statistical work for the new Director of Purchases and for the War Council. During February steps were taken to separate the Division into two parts, leaving a civilian branch with the Council of National Defense and transferring the Army branch to the War Department. Finally, in the first week of April, 1918, the Division of Statistics moved all of its workers who were dealing specifically with war problems to offices in the State, War, and Navy Building, and started on its second year of war service as the statistics branch of the General Staff.

INDUSTRIAL INVENTORY.

In 1916, a year before the war started, the Naval Consulting Board undertook a survey of the industrial resources of the country

in order that if war should be declared industry might be immediately mobilized for war purposes. When the Council of National Defense came into existence in December of 1916 it took over these records. During the following months tabulations were completed of the plants, machinery, and resources of more than 40,000 manufacturing firms. After the declaration of war the General Munitions Board was organized under the council, and the schedules and files of the industrial inventory were transferred to it. About the middle of August the industrial inventory records were transferred from the General Munitions Board to the Division of Statistics.

Until the 1st of December the section handling the industrial inventory concentrated most of its attention on interviewing manufacturers who wished to offer their services to the Government, recording new data concerning plants and capacities, and furnishing specific items of information to the different supply bureaus of the various war agencies. Special assistance was given to the Equipment Division of the Army Ordnance Department in locating firms which might be called upon for war work.

About December 1 special machinery was put in motion whereby manufacturers who wished to secure war orders could be put directly in touch with the various supply bureaus of the Army and Navy interested in placing orders of the kind desired. Lists of producers were prepared on a variety of war materials, and these lists distributed among the supply bureaus. The task of interviewing manufacturers greatly increased. Through December and early January a special fund of information was collected and reports made on the automobile, bicycle, and motorcycle industries. Definite cooperative relationships were established with the Chamber of Commerce War Service Committees, the Control Bureau of the Army Ordnance Department, and the Conversion Section.

As work progressed it became increasingly evident that closer relations must be established with the Conversion Section. The files of the inventory were reclassified and a new cross index devised in order to extend the opportunities for effective cooperation. Finally, on February 16, it was decided to combine the two offices, and early in the following week the industrial inventory was transferred and became a part of the Conversion Section.

WAR CONTRACT FILES.

The War Industries Board of the Council of National Defense, as one of its important functions, advised the various purchasing bureaus concerning where and on what terms contracts for war materials should be placed. It also exercised the function of directing

manufacturers to give priority in their factories to specified orders. To give wise advice concerning contemplated purchases and to determine against which contracts priority orders should be issued it was obviously necessary to know what other contracts were held by the same firms, their degree of importance, and the speed with which they were being filled, but at the time the War Industries Board was appointed it was very nearly impossible to secure this essential information.

During peace time it was the custom for the various Government supply bureaus to go directly into the open market for purchases. There were no shortages of supplies, and the direct method seemed to secure speedy and satisfactory results. Shortly after war was declared, however, the open-market method began to cause trouble. Some well-known firms were given more than they could handle, while obscure manufacturers were unable to keep their workers busy. War contract records were filed in 25 different buildings in Washington, and many contracts were let from depots and arsenals in other parts of the country and no records sent to the Washington offices. Some of the older firms held contracts with each of the 19 different war agencies. There was no single place in Washington where it was possible to find out for a given firm how many war orders had been placed and what bureaus they were for. Accordingly, in the resolutions of August 17, the War Industries Board requested that the Division of Statistics collect information on war contracts and deliveries for the Army, Navy, Shipping Board, and Allies.

The division had already made several studies of contracts and deliveries for certain types of war supplies, but it had no machinery for securing all the information asked for. Early in September, at the request of the Secretary of War, the General Staff appointed a liaison officer to assist in drawing up a plan whereby reports on contracts could be secured regularly from the different corps. On September 19 an order was issued by the Secretary of War to the heads of the five supply bureaus, reading in part as follows:

(a) That an officer be detailed in each of the five purchasing bureaus (Quartermaster, Ordnance, Engineer, Signal, and Medical) to furnish or make available statistical information as required to the Director of the Statistical Division of the Council of National Defense, said officer to act as liaison officer between the several bureaus and the Director of the Statistical Division.

(b) That a list be furnished the Director of the Statistical Division of the Council of National Defense at once by the chief of each bureau concerned of the primary essential articles crucial to the successful maintenance and operation of our armies in the field.

A memorandum from Tasker H. Bliss, major general, Chief of Staff, to The Adjutant General, September 27, 1917, amplified the provisions of the September 19 order.

WAR CONTRACT FILES.

The War Contract Files were established in substantially the manner outlined in these communications. Liaison officers were appointed by the Army bureaus, and corresponding appointments of civilians to work with them were made by the Division of Statistics. Similar relations were established with the Navy, with the various Allied Missions, and with the Shipping Board. By the middle of October lists of essential articles had been secured from the five supply bureaus of the Army, the six of the Navy, the Marine Corps, the five Allied Missions, and the Shipping Board, making a total of 19 war agencies. It was soon found, however, that frequently a priority order for one contract placed by an Army department implied the need for a long list of secondary priority orders on contracts made by the manufacturer with others who were to supply him with raw materials, and there was no means of ascertaining through the central files how many such secondary orders had been placed.

In order to secure supplementary information, about 1,200 letters were sent out during the week of October 13, asking manufacturers for specified information concerning direct and indirect orders for the United States Government and for the Allies. When these reports began to come in the information they contained was entered with and checked up against the contract records already listed. Interviews were held with many manufacturers who tendered their reports in person. It was early arranged to secure regularly monthly reports from the manufacturers, giving not only information concerning all new war orders received during the month, but also statements concerning progress and deliveries on earlier orders. The mailing list of 1,200 rapidly grew until at the present time it includes about 3,000 firms.

In addition to collecting and making available information concerning contracts and deliveries by firms and by particular articles manufactured, the Contract Files Section has made a series of special studies and reports. It prepared, for example, maps showing the locations of firms holding Government orders, unclassified, and by particular industries. It furnished the Fuel Administration with information concerning the firms to which priority should be given on coal shipments. It gave assistance to various committees studying such questions as the supply of optical glass, distribution of power for manufacturing purposes, concentration of Government orders for clothing, available capacity and unemployment in the clothing industry, and the like.

The monthly report blank from manufacturers was extended to include information concerning the per cent of capacity at which plants were operating, capacity for further Government orders, and causes for delay in deliveries on contracts, and with this as a basis

on February 2 the first number appeared of the War Contracts Bulletin. About 80 copies of this bulletin are issued daily and special labor bulletins every week. The bulletin gives brief summaries of labor conditions in different industries, lists causes of delay in deliveries, reports cases of unutilized plant capacity, and in general seeks to furnish information which will be of use to those who are placing war orders. The War Contracts Section, like the industrial inventory, remains in the Council as a civilian organization.

GRAPHIC PROGRESS REPORTS.

The weekly progress reports started with four diagrams prepared for the Secretary of War during the week ended August 25. Three of these related to contracts and needs for quartermaster supplies, and the fourth to the sinking of British merchant ships. These diagrams were drawn by hand, and three copies of each were made, one for the Secretary of War, one for the Director of the Council, and one for the files. Every week since that date a report on the progress of war preparations has been compiled by the Division of Statistics for the use of the Secretary of War and the Chief of the General Staff.

When the Contract Files were started, liaison officers were appointed to secure records of contracts and deliveries from the different Government supply bureaus, and very shortly the material which they secured was found valuable as a basis for measuring progress in the procurement activities of the war. Careful preparations were made for the handling of the graphic reports. So confidential was the nature of the work that the Graphic Progress Reports Section was conducted as a separate office from the others in the division, and every precaution was taken to prevent outsiders from securing secret information which might be of value to the enemy.

The first graphic reports were drawn by hand. The number of items increased until, when there were four copies of 40 pages each, so that 160 diagrams had to be drafted every week, the limits of the staff were reached and it was found necessary to install a photostat machine so that diagrams might be reproduced in large numbers by the photographic process. The report has been continued and extended in scope by the statistics branch of the General Staff of the War Department.

RAW MATERIALS.

On July 28 the first of a series of weekly reports on coal production was prepared by the Division of Statistics in cooperation with the Geological Survey. About two weeks later material was secured from the survey for 32 diagrams on the production and importation of war minerals. On August 17 the War Industries Board passed resolutions requesting among other things that regular information

be made available on the mining of raw materials used for war purposes, the future needs for war material, and the future steel needs of home industries.

The first special reports on raw materials were prepared during the week of September 22, and covered questions concerning coal, antimony, nickel, copper, petroleum, and wool; while work was started on wire, rope, lead, and tin. During the month of September arrangements were gradually worked out whereby the Geological Survey would cooperate in carrying on the studies of raw war materials, and during the week of October 6 the head of that office assigned some 25 specialists to assist with the work of making reports on conditions affecting the production of necessary war minerals in which shortages were threatened.

The Geological Survey has for years received reports on mineral outputs from mining companies all over the country. These reports have been secured under promises of profound secrecy. So confidential were they that even the Department of Justice was refused access to the records. The War Industries Board needed this information, but under the existing regulations there was no way of securing it. In this emergency the Division of Statistics, through channels opened by the Geological Survey, got in touch with all the companies who were affected, and as a patriotic contribution secured their permission for the release of essential data concerning weekly minerals output. With these reports as a basis, there was started a weekly bulletin, which was in fact a weekly production census of essential war minerals. This census is regarded as strictly confidential, and is used chiefly by the Metallic Sections of the War Industries Board.

About the 1st of December the Statistical Division of the council, the War Trade Board, and the Geological Survey organized an Office of War Minerals Statistics for the purpose of centralizing statistical inquiries and securing essential information with a minimum of duplication. From this small and unofficial beginning has since developed the Joint Information Board on Minerals and Derivatives, representing some 12 departments and war boards. About this time aluminum, nickel, and antimony were added to the list of metals for which weekly country-wide censuses of production were compiled, and the periodical reports were supplemented by special studies in answer to particular problems.

Toward the end of October a request came from the Raw Materials Division of the Council that the Statistics Division undertake to carry forward censuses of chemical products essential in the manufacture of explosives. Progress along this line was slow, until, toward the end of December, the first steps were taken toward handling chemical studies on a cooperative basis similar to that arranged for

minerals and the Joint Office on Chemicals Statistics was formed by representatives from the Ordnance Department of the Army, the Navy, and the Division of Statistics of the Council. About January 19 arrangements were made to secure the cooperation of the Bureau of Mines and the War Trade Board. Toward the middle of February the Chemical Alliance offered its support in securing information from members of the trade.

On the 12th of January 13 copies of the first Raw Materials War Bulletin were distributed. This bulletin contains summaries of the production and consumption statistics of all three classes of raw materials. It is a comprehensive document, consisting chiefly of tables and diagrams reproduced by zinc cuts. About 45 copies are printed weekly and are distributed, for confidential use, among the principal war agencies of Washington.

The work of the section at first consisted of three main divisions—minerals, chemicals, and other raw materials. About the middle of March the Central Committee on Statistics of Hides and Leather was formed as part of the third group. The members of this office included representatives of the Shipping Board, the War Trade Board, and the Division of Statistics of the Council.

Raw Materials is one of the three sections which remained as civilian offices of the Council after the sections dealing directly with military information were moved to the State, War, and Navy Building. The connection of the two branches continues to be close, and information needed by Raw Materials from the different departments of the Army is secured through the Statistics Branch of the General Staff.

The War Industries Board has organized a Requirements Division, which is requesting information on the requirements of raw materials by the different war agencies so that a basis may be secured for determining where priority orders shall be granted. In addition, the Shipping Board and the War Trade Board have been given power to limit imports, in order to release tonnage for war purposes. Questions are arising concerning what are the essential imports for which provision must be made. An increasing amount of the time and effort of the Raw Materials Section is being devoted to this work.

FOREIGN INDUSTRIAL DEVELOPMENTS.

The resolutions of the War Industries Board on August 17 requested that information be gathered on the prices paid abroad for war munitions. A translator and research worker was secured for this field, and a series of special reports was prepared dealing with varied forms of industrial experience abroad. The Section of Foreign Industrial Developments remains as one of the civilian branches of the Council.

REMOUNT SECTION.

Early in September the Remount Section of the Quartermaster Corps requested Mr. R. H. Williams, assistant to the Director of the Council, to assist in the purchase of horses and mules for the Army. This work involved the keeping of comprehensive records and the Division of statistics offered to help by assigning members of the force to handle remount statistics. Occasional reports were prepared on the progress of procuring animals, and about the middle of November these reports were incorporated into a regular weekly bulletin of tables and diagrams, and the work was made into a separate section.

Records were kept for 32 cantonments and statistics were compiled on needs, orders, purchases, deliveries, and shipments of animals, trucks, and similar equipment. This material was presented in graphic bulletins weekly from November until March. On March 2 arrangements were made to transfer the work to the Remount Division of the Quartermaster Corps and the office in the Division of Statistics was discontinued.

TONNAGE SECTION.

Late in the summer of 1917 questions arose with increasing insistence as to the adequacy of the available shipping tonnage to continue carrying the necessary supplies for the Allies and, in addition, to care for the transportation of the American Expeditionary Force. Since the Division of Statistics was collecting data as to the purchases of the Allies and also reporting on the program of supplies for the American Army, it easily came about that it undertook to compute the combined necessities for shipping. Its work soon developed into a more definite investigation of the tonnage needs of the American Expeditionary Force and the available resources in terms of ships.

The first important report was made about the middle of September, when the General Staff requested information concerning how much tonnage must be set aside for the Allies during the coming year. This report led to further requests for estimates of tonnage requirements of our own armies and for the amount of ship tonnage available. The work of the staff at once centered on securing data concerning probable output of new tonnage, military needs, domestic needs of nonmilitary imports, probable requirements of mineral imports, and related problems.

About November 3 arrangements were concluded whereby data were made available by the Navy on transport service, administration of convoys, sinkings, boat facilities, and certain other types of information which were essential to an intelligent study of the tonnage situation.

The first important report on the shipping situation was finished during the week of November 24. By the first week in January more than 40 separate tonnage reports and memoranda had been compiled. Of these perhaps the three most important were the lengthy memorandum with regard to the report made by the Shipping Board to the Secretary of War, a report upon what the pledges made to the Allies involved in the way of tonnage and the degree to which the pledges might be met, and a complete reestimate of tonnage requirements made at the request of Gen. Bliss. The Tonnage Section has now been put on a military basis and is part of the Statistics Branch of the General Staff.

ORGANIZATION CHARTS.

Practically the first piece of work of the division was the compilation of an organization chart of the Council of National Defense. The next development was assisting in working out and undertaking the diagramming of the organizations for the many committees, sections, and divisions of the Council.

An interesting early phase of the work was the diagramming of the organizations of the war ministries of Germany, France, and England. In addition to charts for use in the Council, forms were worked out for outside organizations such as the Ordnance and Quartermaster Departments, Signal Corps, Medical Department, Red Cross, Food Administration, Department of Labor and the General Staff.

MAPS.

During the early weeks of the war one of the considerable activities of the force was map making. On account of the change of the boundaries of the Army departments, there were no available maps showing the new arrangements, and the division was called upon to prepare large numbers for use in the various Army and Navy offices. Maps were also drawn showing the locations of Army posts and camps, and in addition a considerable number of pin maps were arranged for map drawers in cabinets, with pins indicating the locations of munitions factories, the distribution of local Councils of Defense, the locations of medical war committees, and the like. Map making has now become one of the minor activities of the division, but a few are still called for from time to time.

On January 26 the director of the division was given an office in the War Department to facilitate the beginning of statistical work for the new Director of Purchases and for the War Council. In March larger quarters were secured and by the 1st of April the military sections of the division were transferred to their present quarters in the State, War, and Navy Building.

PERSONNEL.

During its first week the Washington staff of the Division of Statistics consisted of the director and three assistants, members of the staff of the Russell Sage Foundation, which contributed their services to the work. Very rapidly, however, as the work grew, more statisticians were transferred from the New York offices of the Foundation, until early in June active work was confined entirely to the Washington corps. It was soon necessary to secure additional assistance from outside.

The Council of Defense was carrying a tremendous load under a seriously inadequate appropriation. It could not afford to pay salaries large enough to secure competent statisticians under ordinary competitive circumstances. The salaries of a few of its former staff were contributed by the Russell Sage Foundation, but most of the new workers had to get along on barely enough to pay their living expenses in Washington. That the division was able to secure so highly trained and competent a staff is evidence of a superior type of patriotism on the part of its people.

Fifteen of the staff had at one time been university instructors or professors, five were Rhodes scholars, an actual majority of all workers, including draftsmen and stenographers, had pursued graduate university study after receiving the bachelor degree. The result of this insistence upon educational qualifications was that most of the members of the staff were capable of carrying on independent work. The very large number of memoranda, reports, and bulletins prepared by the small working force—which never numbered more than 67 members and most of the time averaged considerably less—can be accounted for chiefly on the ground that there were no unskilled workers in the group.

When the sections dealing with military statistics were transferred to the War Department Dr. Leonard P. Ayres, the director, and 10 of the 24 civilian members were given commissions as officers in the National Army.

BULLETINS AND REPORTS.

The following bulletins are regularly issued by different sections of the Division of Statistics:

War Contracts Bulletin, daily.

Labor Bulletin, weekly.

Minerals Census, weekly.

Chemicals Census, weekly.

Raw Materials Bulletin, weekly.

Remount Report, weekly (discontinued Mar. 2).

Propellants and Explosives Bulletin, monthly.

Tonnage Report, monthly (transferred to War Department Mar. 11).

Graphic Progress Report, weekly (transferred to War Department Mar. 11).

In addition to the foregoing, some 90 special bound documents and large numbers of smaller reports and memoranda have been prepared by the Division of Statistics dealing with special problems of the war program.

AIRCRAFT PRODUCTION BOARD.

The Aircraft Production Board carried on its activities in accordance with the resolution of the council of May 16, 1917, until October, 1917, on which date its functions and duties were taken over by the Aircraft Board, newly created by act of Congress.

COMMITTEE ON COAL PRODUCTION.

The appointment of the United States Fuel Administrator on August 23, 1917, carried with it definite authority which the Committee on Coal Production had lacked and largely relieved the committee from the responsibility of increasing production. As a consequence the constructive work which the committee had been doing passed to the new body. The Fuel Administrator took over the operation of the Lake Erie Bituminous Coal Exchange, the Tidewater Coal Pool, and the organization which had been supplying the Government's coal, and the activities of the committee became restricted to giving advice to the Council of National Defense and to the Fuel Administrator at such times as he asked for assistance.

On February 25, 1918, it having become evident that the usefulness of the committee was at an end, the Council of National Defense accepted its resignation.

COMMITTEE ON HOUSING.

A special committee was appointed by the Council in October, 1917, to report on the situation regarding housing for industrial workers. This committee convened in the middle of October and held a two weeks' hearing to determine if a lack of housing existed in localities where war products were being fabricated. Some 28 witnesses were heard, and it was demonstrated beyond question that many war industries of various descriptions were being restricted in output through a lack of homes to house the needed workers.

It developed that the Government, in order to take advantage of organizations and factories which had become skilled in munition making through orders from the allies, had placed orders in such

centers as Bethlehem, Bridgeport, etc. These communities, by reason of the restrictions of credits due to the war, were unable to provide even for the normal increase in housing facilities, much less did they meet the demands of the war emergency. In many instances, in letting contracts for war materials, provision was made for the addition of new and the extension of old plants, but only in very rare instances had any provision been made for the housing of workers to operate these plants when filled with war orders. Since that time many plants that were projected have been completed, additional contracts have been let, and the need for housing correspondingly increased. Complaints as to restriction of output, varying from 30 to 50 per cent, due to this cause, came in from many localities.

The lack of housing had caused overcrowding, unsanitary and in many cases impossible living conditions, thus affecting the efficiency of the worker, which is reflected in a limitation of output and an increased cost of production. Further, the overcrowding of localities had not only affected the worker's health and efficiency, but submitted him to great financial loss due to increased and unreasonable rents, or extra cost for transportation. It became evident that there was a direct relation between the housing of industrial workers and their consequent health, efficiency, and ability to do a day's work, thus securing as nearly as may be the economic and capacity output in the various industrial plants engaged in the fabrication of war products.

RECOMMENDATIONS OF THE COMMITTEE.

On October 31 this committee handed in a report containing the following findings and recommendations:

It thus appears that as long as present conditions are allowed to continue, each day that passes will be measured by a serious and perhaps vital loss in ships and munitions. The committee feels that the existing emergency demands immediate action and is convinced that under proper safeguards the Government should give quick financial aid to such industries or communities as can clearly demonstrate their right to relief. In this regard it is suggested that any aid which may be given by the Government should be preferably rendered in the form of loans at a low rate of interest. Some loss to the Government may reasonably be expected, but the expenditure necessary to give relief is negligible when measured by the loss incident to delay in the execution of the vast war orders already placed.

If relief is to be afforded, funds and a properly constituted agency to administer them must be provided. From the testimony it appears questionable whether there are any funds immediately available for housing purposes other than, perhaps, from the President's emergency fund. Congress not being in session, to await congressional action would necessitate serious delay.

The committee believes that an organization of reasonable permanency and authority is necessary to administer quickly and effectively such funds as may be available for housing purposes. The organization should have broad powers

to conduct building operations, to deal in real estate and securities, and to borrow and loan money. To accomplish this purpose, a trusteeship is proposed, with the name of the "Emergency Housing Association," to be administered by trustees under the general control of the President.

The committee offered the following recommendations:

1. (a) In line with the findings of the Advisory Commission of the Council of National Defense, all authorized agencies of the Government making contracts for war materials shall give due consideration in the future to the labor supply and housing conditions prior to closing contracts.

(b) Future contracts shall be distributed as far as possible to prevent undue concentration of workers in any one locality.

2. A fund of approximately \$20,000,000 should quickly be made available to furnish aid where an imperative need for assistance is proved, and additional funds should be provided in the near future.

3. Immediate steps should be taken to form some permanent organization to administer such funds as may be necessary and available for housing purposes.

In conclusion, the committee desires to emphasize its conviction that any Government aid for industrial housing should be considered strictly as a war measure and be rigidly confined to cases where the restriction of output of war materials would otherwise occur.

On November 12, 1917, Otto M. Eidlitz was appointed a committee of one to see if it were possible to secure funds for housing through existing appropriations or by the extension of existing contracts. It was found that the War Department could practically do nothing more than temporary housing; that the Navy Department, under the urgent deficiency bill of October 6, could provide permanent housing where torpedo boat destroyers or their accessories were being fabricated; and that the Shipping Board had funds which could be construed as available for the providing of housing.

On November 24 a letter was sent to the Secretary of War, as chairman of the council, outlining a program for housing relief, as follows:

As directed by the chairman of the Council of National Defense, I have taken up the question of the lack of housing for industrial workers in various localities in connection with the departments of the Government, and find that the Army believes that only housing of a temporary nature could be provided for or that temporary relief might be available under the urgent deficiency bill of October 6, 1917, which contains the provision whereby 30 per cent of the amount of an order may be advanced to the manufacturer under certain conditions. But in view of the fact that the money would have to be paid back by June 30, 1919, this clause can hardly be considered helpful in the situation.

It is believed that funds are available both in the Navy Department and in the United States Shipping Board. It therefore becomes desirable to classify the cases thus far investigated and to provide a financial program, as follows:

HOUSING FOR INDUSTRIAL WORKERS ON WAR PRODUCTS.

In determining housing relief in localities where the lack of these facilities is restricting the output of war products, it is imperative to arrive at a definite program, so that, as far as possible, the same consideration will be given by the

Government to all those demonstrating their right to receive it. Furthermore, it is vital that this governmental aid shall be recognized as a war emergency measure to attract and induce workers to make their homes in certain localities, and should not be regarded or administered as an individual loan made under normal conditions.

From investigation thus far, three phases of the housing problem are manifest:

I. A community problem where a number of industries are fabricating war products.

II. Where an individual plant is fabricating war products in an isolated position, and its employees are the bulk of the working population.

III. Where the company or corporation is fabricating war products under an agency contract in a plant Government owned.

The following solution is suggested for each of these cases:

I. For the community problem, manufacturers, etc., to furnish 20 per cent of the cost of the total operation. The Government to furnish an 80 per cent lot for same at a 4 per cent rate for a term of 15 years; the Government loan to be amortized at the rate of 3 per cent per annum. Final balance to be paid at the end of 15 years. The Government to receive a blanket mortgage covering the whole of the transaction. Refund and adjustment to be made on houses as they are sold, and audit permitted whenever desired by the Government. It must further be understood that the dividend must be limited in order to enable the workers to acquire these houses at a reasonable price or to occupy them for a reasonable rental, due to the advantage of a large loan at a low rate for a long time.

II. For the isolated plant, the corporation or individual operating it should supply the land and, if possible, the necessary underground service, such as sewerage, water, light, and paving, and the Government shall furnish all the funds required for the actual building at 4 per cent for a period varying from 10 to 15 years. The Government to receive a blanket mortgage covering both land and buildings. Furthermore, the corporation or individual should increase the staff of the accounting office handling owned real estate, as may be necessary, keep a separate set of books for handling the property for which the Government has made the loan, and if possible, make no charge for this service. Furthermore, periodic examinations of the accounts will be permitted by authorized agents of the Government, and the individual or corporation shall make an accounting to the Government every three months and shall refund and adjust the mortgage for houses sold.

III. In Government-owned plants operating under agency contracts due to the fact that the Government owns the housing of the machinery, there is no reason why it should not own the housing for labor. In cases of this kind it is suggested the full amount be provided by the Government for the entire building operation, preferably cooperating, as to the construction with the individual or corporation acting as its agent at the plant. The value of the land must be stipulated at the outset and the Government shall have the right to acquire it at that price. The agent of plant to adjust mortgage and refund as houses are sold. Consideration should be given to labor under solution II and III, so that it may acquire the houses at a reasonable price or occupy them at a reasonable rental. In all cases, land values must be fixed at the outset. Plans for houses should be passed on by properly organized experts so as to secure standardization and economy in the interest of proper housing, and to conserve future values. Priority shipments must be secured and the operation inspected and safeguarded as to development, construction, and finances.

The Council of National Defense, at its meeting on January 10, 1918, informed Mr. Eidlitz that while the Committee on Housing would continue as advisory to the Council of National Defense, the administration of housing matters was now in charge of the Secretary of Labor, and questions relating thereto should be taken up with Secretary Wilson for his approval.

On the 12th of February, 1918, Mr. Eidlitz accepted the appointment of the Secretary of Labor as Director of the Bureau of Industrial Housing and Transportation of the Department of Labor.

SECTION ON INDUSTRIAL SERVICE.

(Dissolved January, 1918.)

The Section on Industrial Service was instituted by the Council as the result of its decision on November 2, 1917, to authorize the director to undertake the following work:

1. To determine present and probable future demand for labor in war industries.

2. To determine in connection with the Priorities Committee of the War Industries Board the relative priorities of the labor demand.

3. To arrange for the supplying of the demand through the Department of Labor or such other governmental or civilian agencies as can best meet the demand.

4. To determine the needs for dilution of labor, including the introduction of women into industry and recommend policies to be followed in regard thereto.

Through the months of November and December the section carried out a series of investigations along the lines indicated in this resolution of the Council. The section's work was supplemented by a series of conferences on the subject of labor policies, shared by representatives of the various departments of the Government interested in the problem, and their joint recommendations outlining a program for war labor administration was submitted to the Council late in December. The program was submitted with the Council's approval to the President, who authorized its administration by the Secretary of Labor.

In his request to the Secretary of Labor of January 4, 1918, he asked that the following agencies be provided for carrying out the plans submitted:

1. A means of furnishing an adequate and stable supply of labor to war industries. This will include:

- (a) A satisfactory system of labor exchanges.

- (b) A satisfactory method and administration of training of workers.

- (c) An agency for determining priorities of labor demand.

- (d) Agencies for dilution of skilled labor as and when needed.

2. Machinery which will provide for the immediate and equitable adjustment of disputes in accordance with principles to be agreed

upon between labor and capital and without stoppage of work. Such machinery would deal with demands concerning wages, hours, shop conditions, etc.

3. Machinery for safeguarding conditions of labor in the production of war essentials. This to include industrial hygiene, safety, woman and child labor, etc.

4. Machinery for safeguarding conditions of living, including housing, transportation, etc.

5. Fact-gathering body to assemble and present data, collected through various existing governmental agencies or by independent research, to furnish the information necessary for effective executive action.

6. Information and education division, which has the functions of developing sound public sentiment, securing an exchange of information between departments of labor administration, and promotion in industrial plants of local machinery helpful in carrying out the national labor program.

With the President's determination that the Department of Labor should be the agency to undertake the national war-labor administration, the responsibility for achieving the purposes underlying the creation of the Section on Industrial Service was transferred to that department and the section was therefore dissolved, its chief, Dr. L. C. Marshall, becoming a member of the Advisory Council to the Secretary of Labor, established to aid in setting up the requisite machinery for carrying out the program.

STEAM RAILROAD TRANSPORTATION.

(Dissolved December, 1917.)

In the First Annual Report of the Council of National Defense a general statement was made concerning the activities of the Committee on Transportation and Communication, under the chairmanship of Commissioner Daniel Willard, and special reference was made in that connection to the voluntary cooperation of the steam railroads, in response to a resolution passed by the Council of National Defense requesting Commissioner Willard to call upon the railroads to so organize their business as to lead to the greatest expedition in the movement of freight. In response to that request the railroads, acting through their executive officers at a conference held in Washington on April 11, 1917, appointed an executive committee consisting of the chief executives of five of the principal railroads in the United States, and practically all of the individual companies in the United States gave to the subcommittee so constituted authority to direct their operations so that the entire railroad mileage of the United States might, so far as was legally permissible, be operated as a national system during the period of the war, in order that the transportation requirements growing out of conditions developed by the war might be most effectively met.

Some reference was made in the First Annual Report to the work done by this committee, but the following additional information concerning its activities may very properly be made a part of this report.

From the date of its creation the committee, "stirred by a high sense of their opportunity to be of the greatest service to their country," set themselves to work to secure, by coordinated and co-operative effort, the maximum amount of transportation possible with the facilities at the command of the carriers, to enlist the co-operation of the general public, interstate and State commissions, boards of trade, and other public bodies in securing better car loading and to induce shippers to submit to some inconvenience and delay by holding merchandise cars for full loading and despatch on specified or so-called "sailing days."

Some of the difficulties that confronted the railway board and militated against its efforts to procure still greater output were:

1. To handle a freight traffic far exceeding any ever before offered while greatly hampered by the contemporaneous movement of over 2,000,000 troops, and thereafter to meet their demands for facilities to exchange visits with their families. In the month of October, which showed the heaviest freight movement in the history of American railroads, increases of 23 per cent in passenger, 20 per cent in express, and 14 per cent in parcel-post traffic had to be reckoned with.

2. A serious congestion on eastern lines, due to the difficulty in securing coordination of the Government's shipping agencies with those of the carriers, an impediment that the committee was never able fully to overcome.

3. The railroads had insufficient motive power properly to meet the demands created by the war; locomotives on order could not be obtained and the skilled labor necessary to repair them was taken from the railroads for military and other war purposes. Nevertheless the percentage of locomotives under repair in the last six months of 1917 was far less than in 1916.

4. Increased burdens were thrown on the railroads by the impressment of steamships engaged in Atlantic coast and New England coal traffic, and from the substantial abandonment of the Panama Canal route by vessels that were offered unusual inducements in trans-Atlantic trade.

The Railway Executive Committee, or the War Board, as it came to be called, instituted a number of reforms that it was thought would be of lasting benefit to the transportation system of the country. Some of its activities were as follows:

1. Formulated the most satisfactory car-service rules that had existed up to that time, arranged for the pooling of box and

coal-carrying cars so that they circulated as freely as bank notes, and transferred locomotives from noncongested to congested lines.

2. Developed the most cordial and cooperative relations with the general public, individual shippers, commercial bodies, and State railroad commissions.

3. Conducted an active, continuous campaign to conserve transportation by intensive locomotive and car loading, in consequence of which the record 38,075,000,000 ton-miles of October, 1917—an increase of over 5 per cent over the previous year—were moved, with a substantial decrease in freight-train and loaded-car miles.

By consent of State commissions and of the public generally a large reduction was made in passenger-train mileage, resulting in a saving of nearly 2,000,000 tons of coal per annum and diverting 570 locomotives and 2,800 train and engine men from passenger to freight service.

4. Developed a policy of moving cars empty to equalize car supply, and, although at great expense to the lines involved, all orders were promptly obeyed.

5. Created coordinating committees on exportation, which assembled information as to available ocean tonnage and possible diversion of traffic to prevent congestion.

6. Collaborated with the Committee on Coal Production of the Council of National Defense to pool lake and tidewater coals and reduce the number of classifications to an extent that greatly expedited traffic by land and by water.

7. Cooperated with the Priorities Committee of the General Munitions Board to expedite construction material.

8. Effected a great simplification of accounts relating to Government transportation, and expedited the movement of Government freight.

9. Prepared designs for and built sample armored cars and equipment for hospital and troop trains.

10. Prepared complete routing charts for Government use in moving troops between military posts and mobilization points and cantonments, eliciting high praise from the Secretary of War, thus:

This strikingly illustrates the patriotic cooperation of American railroads with the Government and also the tremendous capacity of the American railways.

11. Created a subcommittee, composed of the vice presidents of the four express companies, to coordinate express transportation.

12. In so moving a vast number of cars of cantonment building material and supplies as to merit the commendation of Col. I. W. Littell, in charge of cantonment construction, thus:

In the construction of the cantonments to date 50,000 carloads of material have been transported and been delivered at the sites—an enormous tax on the

already overburdened railroads of the country. The railroads, however, have given splendid service. All Government orders have been given precedence and the lumber and other supplies needed have been rushed to the cantonments in record time.

The Railway War Board increased the efficiency of plant and equipment in every direction in spite of obstacles and handicaps that it had to overcome.

The number of freight locomotives and cars actually in service was increased by greater speed in repair shops, and train and car loads were largely increased, the effect of all of which is finally reflected in increases of ton-miles handled per month by individual locomotives and cars, and in the constructive addition of 4,897 locomotives and 339,427 freight cars to the equipment of the carriers during the first half year of the board's life, equivalent to the purchase without cost of one and three-quarters years' normal orders for locomotives and two and one-third years' normal orders for cars.

The Quartermaster General of the Army and the Secretary of War in their annual reports for 1917 accorded high praise to the railroads for the importance and value of the services rendered to the Government.

The functions and life of the committee were ended by the proclamation of the President of the United States of December 26, 1917, taking over the railroads under Government control. The reasons actuating him in taking over the roads and his estimate of the work of the Railway War Board appear in the statement accompanying his proclamation, thus:

It was thought to be in the spirit of American institutions to attempt to do everything that was necessary through private management, and if zeal and ability and patriotic motive could have accomplished the necessary unification of administration it would certainly have been accomplished; but no zeal or ability could overcome insuperable obstacles, and I have deemed it my duty to recognize that fact in all candor, now that it is demonstrated, and to use without reserve the great authority reposed in me. A great national necessity dictated the action, and I was therefore not at liberty to abstain from it.

* * * * *

The committee of railway executives who have been cooperating with the Government in this all-important matter have done the utmost that it was possible for them to do; have done it with patriotic zeal and with great ability; but there were difficulties that they could neither escape nor neutralize.

COMMITTEE ON TELEPHONES AND TELEGRAPHS.

Both the direct and indirect war work of the telephone and telegraph companies has been carried on in full cooperation with the various Government Departments. By the first of 1918 the plans for cooperation between the telephone and telegraph companies and the Government had been largely completed so that from that date on the committee, as a committee, was not especially active.

COMMITTEE ON ELECTRIC RAILROAD TRANSPORTATION.

The work of this committee consisted in assembling data and preparing a series of maps for the use of the War Department. On February 21, 1918, a conference was held with the acting chief of the War College, and it was decided to continue the work under the auspices of the War College.

COMMITTEE ON INLAND WATER TRANSPORTATION.

(Dissolved February, 1918.)

The Committee on Inland Water Transportation was created by the Council of National Defense on June 15, 1917.

The primary function of the Committee on Inland Water Transportation, and that to which its efforts were mainly addressed, was the study of the feasibility of utilizing the navigable waters of the United States for the relief of freight congestion on the railroads. The subject was divided for investigation and consideration into three parts:

First. What carriers were available for immediate service; their geographical distribution, tonnage, type, service for which adapted, physical condition, insurability, and whether actively employed or not. This division included carriers owned by the United States.

Second. What obstacles, if any, interfered with the full use of existing tonnage, such as loading, unloading, transfer charges or facilities, insurance, towing charges, etc.

Third. What steps were necessary for, and, if taken, seemed likely to result in the creation and use of a considerable fleet of water carriers of a commercially useful type.

Proceeding along these lines, an increasingly large and extensive correspondence was carried on, many interviews were held, and a number of conferences and conventions were attended. Examinations on the ground were made of a number of waterways, including the Mississippi, Ohio, Tennessee Rivers, also of the Warrior and other minor rivers; of the New York Barge Canal, the Delaware & Raritan Canal, the Schuylkill and Lehigh Canals, the Chesapeake & Delaware and Dismal Swamp Canals, the intracoastal waters and portions of the tributary rivers on the Atlantic seaboard from New York south to Beaufort, N. C., and more or less detailed surveys were made of the available craft, terminal facilities, and traffic conditions on them. Experimental trips were arranged, with a view to determining the feasibility of transporting freight on the upper and lower Mississippi, the Ohio, the Kentucky, and the Tennessee Rivers. While they did not in all cases show a profit in earnings, or accomplish the trips as expeditiously as expected, the causes were so apparent and the remedies so simple that they left no room for *doubt that with proper plant and terminal facilities, properly man-*

aged and financed, a very large amount of freight then going by rail could be properly diverted to those waterways and thereby commensurately relieve congestion in rail traffic.

Carefully considered designs of steel towboats and barges, of types and dimensions best adapted for commercial use on the Mississippi River, were prepared, and, at the instance of the President, after approval by the Secretary of War and Secretary of Commerce, an allotment of \$3,360,000 was made by the United States Shipping Board from the funds of the Emergency Fleet Corporation for the construction of a fleet of 24 steel barges and 4 towboats. This fleet was to be used principally in transporting coal mined in Illinois from St. Louis upstream to St. Paul, and iron ore mined in Minnesota downstream from St. Paul to St. Louis. The estimated carrying capacity of the fleet during an average season of open navigation was 180,000 tons each way, or a total of 243,000,000 ton-miles per season of eight months, a service that would require the employment of over 500 freight cars. A large number of other fleets, to be operated over the above-mentioned rivers and other waterways, were projected by private and corporate interests, and some of them were completed as a result of the committee's efforts.

The construction of many publicly owned water terminals, some of them now completed, others in process of building, still others in contemplation, was instigated by the Committee on Inland Water Transportation, which also lent its efforts to ameliorating the congested conditions of rail-carried traffic by means of appeals to shippers in all branches of commerce and to the Quartermaster's Department, also to the Food and Fuel Administrations, that, to the utmost extent found practicable, water carriage be used in moving their freight. Especial effort was made to relieve the coal famine in New England by bringing about a larger movement of coal mined in the Pennsylvania fields to New England by a rail-water-rail haul, using the outside way from Baltimore to Boston, and the Hudson River and Champlain Canal to Burlington, Vt.

On February 16, 1918, the Committee on Inland Water Transportation was discharged and turned its records over to the Committee on Inland Waterways, which was created by the Director General of Railroads. The function of the latter committee was to take up the work of the former where it left off, and after supplementing the work done to the extent and in the manner deemed best to recommend to the Director General of Railroads the acquisition of necessary craft and its operation under the United States Railroad Administration on such inland and intracoastal waters as were deemed capable of advantageously carrying an amount of commerce that would measurably relieve the congestion of traffic on the railroads of the country.

NATIONAL BOARD OF FIRE UNDERWRITERS.

Early in March, 1917, the National Board of Fire Underwriters tendered its resources, facilities, and services for the purpose of aiding in the preparation for the coming struggle. Within the ensuing months this organization furnished extensive data concerning more than 13,000 industrial plants equipped to fill war orders. Particulars were also furnished covering water-supply systems in some 300 American cities. Along the lines of fire prevention, close relationships were established between the National Board of Fire Underwriters, with their trained inspectors and engineers, and the State councils of defense. By this means and by cooperation with various Government departments the trained services of the National Board of Fire Underwriters were brought to the assistance of the Government in the emergency and an immense amount of valuable work was accomplished.

On April 8, 1918, this work was taken over by the newly created Fire Prevention Section of the War Industries Board, an account of whose activities will be found in another section of this report.

COMMITTEE ON SUPPLIES.

(Transferred to Quartermaster Department, January, 1918.)

The committee was subdivided into the four following sections: Woolen goods, cotton goods, knit goods, and shoes and leather.

WOOLEN GOODS SECTION.

This section has devoted itself to the business of assisting the Quartermaster Department in purchasing woolen fabrics for Army use, having in mind three main objects:

(1) *Quantity*.—It became evident very early that enormous quantities of woolen cloth would be required. While at the outbreak of the war less than a dozen mills had been accustomed to bidding on Government contracts, the section secured the cooperation of over 300 mills, comprising nearly all the establishments, both large and small, that were adapted to manufacture Government fabrics.

The section investigated the productive capacity and equipment of all the woolen mills in the country, and by the end of 1917 it is safe to say that not more than 10 per cent of the mills adapted to such work were not engaged in the manufacture of fabrics suitable for military use.

Additional purchases in very large amounts, many of them on very short notice, were made for a number of foreign Governments, and in no case were these allowed to interfere with our own requirements.

The section arranged for the purchase of over 19,000,000 blankets, over 22,000,000 yards of overcoating, over 36,000,000 yards of shirt-

ing flannel, and 35,000,000 yards of uniform cloth, involving an expenditure of over \$350,000,000.

(2) *Quality*.—With the assistance of the cooperative committees of the two associations of woolen manufacturers, specifications were made with the view of maintaining the quality of the Government fabrics and increasing the sources of available supply. While many emergency purchases were made of fabrics not strictly according to specifications, due to urgent and immediate calls from various departments, by the end of 1917 the fabrics which were being manufactured by the different mills were thoroughly standardized.

(3) *Price*.—From April, 1917, to the end of the year prices of raw materials advanced from 30 to 40 per cent, supplies from 25 to 100 per cent, and labor at least 20 per cent. In spite of this advance in the cost of manufacturing, this committee was able to arrange for all the fabrics required at prices less than 10 per cent over those prevailing in April, 1917, while for the four months following August, 1917, a fixed and uniform price was paid for each of the standard fabrics.

GENERAL.

It was necessary to go into a wide field of operation in placing these huge contracts with American manufacturers. The release of large quantities of foreign wools was secured. The consent of the British Government was also obtained to the release of nearly 78,000,000 pounds of Australian wool for military uses at a saving of over \$25,000,000. Arrangements were made for the securing of much necessary machinery and many supplies needed in the manufacture of this tremendous yardage. Hundreds of letters of inquiry were written and advice furnished to many different manufacturers who were consulted on manufacturing problems. With the loyal and valuable cooperation of the woolen industry its resources were placed at the service of the country.

A careful survey of the situation leads to the belief that production was greatly increased, the quality standardized, and many millions of dollars saved in the purchase of woolen fabrics.

THE BASE SORTING PLANT.

Up to August or September the Government contractors who were making clothing for the Government from materials furnished to them by the Government retained as a gratuity all of the rags resulting from the cutting of goods. These in turn were sold by the manufacturers of clothing to the many rag dealers in the trade at prices that before the war ranged from 25 cents to 28 cents a pound up to 40 cents a pound and above since the war. In order to stabilize the price on all woolen materials it became necessary in the refinement

of the job to stabilize the price of all the fundamentals that went into the manufacture of the goods, thus it became necessary to stabilize the price of wool substitutes and shoddies, these for the most part being made from rags and clippings remaining from the goods that were cut for Government uniforms. Uniforms for the Government are made in Boston, New York, Brooklyn, Philadelphia, Chicago, San Francisco, St. Louis, and many other points. Since the Government now owned all of the remnants and rags resulting from the manufacture of uniforms it became necessary to establish a medium whereby these rags could be concentrated or brought together in one spot. To handle this work a base sorting plant under Government control was organized in New York. The gentlemen comprising the base sorting plant were asked to perform this function for the Government because of their technical knowledge of the business so that the redistribution of these rags to the cloth manufacturers could be made in the best and most intelligent manner. A maximum price was thus established upon these cuttings and sold by the Government to the cloth and blanket manufacturers at a uniform price, approximately 10 cents a pound below the market. The resulting saving to the cloth and blanket manufacturers was deducted from the price of the goods sold to the Government, thus giving the Government, first, the advantage of millions of dollars in the savings of the clippings, and, second the resulting savings from the price per yard on cloth and blankets the Government purchased from those manufacturers.

It also eliminated any incentive for clothing manufacturers to use extravagantly the Government cloths, and this saving will be a very large item.

It stabilized the price of reworked wools, checking a rise of 60 per cent from April last and reducing this figure to 45 per cent. This also has been a very large saving to the Government.

It has prevented the profiteering in these reworked wools by those engaged in that industry.

The saving to the Government the first year of the operation of this plant has been upward of \$8,000,000, and the plant will save to the Government many millions of dollars more in the future. All profits accruing from the operation of the plant have been and are the property of the Government, and no charge of any nature has been made for services of the men operating the plant, and all accounts, records, and moneys have been under the absolute control of the depot quartermaster at New York City.

THE USE OF RECLAIMED AND REWORKED WOOL.

Reclaimed and reworked wool, or what is commonly known as shoddy, has been used in conjunction with virgin wool in the manufacture of 30-ounce melton and blankets, and has resulted, on

orders placed since May 1, in large savings by the Government. It has conserved wool to the extent of at least 70,000,000 pounds. It has saved the Government a calculable amount of over \$24,000,000 and an incalculable amount due to the lessening of the demand for raw wool to the extent of 25 per cent of this country's wool clip. In addition, the benefits derived in consequence of the comparatively earlier delivery of cloth and blankets because of the use of reclaimed and reworked wool can not be expressed in terms of dollars and cents.

As to the quality of the resulting cloth, the opinion of the Bureau of Standards, Department of Commerce, to wit, "The importance of new wool fiber as distinguished from reworked wool and mixtures in fabrics has been greatly exaggerated," is very interesting to note.

As a matter of fact, mixtures prepared in accordance with current United States Army specification for blankets and 30-ounce olive-drab melton are superior in heat-retentive qualities to similar cloth produced from the best grades of wool now available, i. e., quarter-blood wools. The reason for this superiority is found in the greater felting quality of reworked wool, resulting in a more complete filling of the interstices which exist in all cloth.

COTTON GOODS.

Beginning in May, 1917, this section studied the markets and needs of all the Government departments for cotton cloth, bandage cloths, blue and brown denims, duck of all kinds and weights, pajama cloths, hospital gauze, domets, flannelettes, and various other fabrics. It listed all available duck machinery and made recommendations covering over 360,000,000 yards of goods; opened up new sources of supply for duck from tire-fabric makers, carpet makers, and cotton mills not ordinarily on fabrics for which there was such urgent need.

It stimulated production, advised as to technical procedure, acted as the advisor of the Priorities Committee on all textile matters, equitably allocated huge quantities of paulin and other ducks over the duck trade, secured for the Government prices running uniformly below, and often far below, the market, coordinated in so far as possible cotton-goods purchases made by the different Government departments, and in addition to the above, at the instance of the War Industries Board, decided as to the distribution of certain grades of duck, on which there is a shortage, to the civilian trade.

It also arranged all waterproofing contracts for the Quartermaster Corps.

KNIT GOODS SECTION.

The quantities of gloves, underwear, and other knit goods needed by the Army were largely in excess of the machine capacity of the country. As a result it was necessary to open up new sources of

supply and to greatly increase the output of present mills in order to meet the requirements. In addition the specifications in many instances were changed, so that the goods ordered became of a much better and warmer quality.

To give a clear idea of the vast quantities bought, and particularly of the short space of time in which the purchases were accomplished, a table of purchases to date of the principal articles, together with the amounts purchased to October 6, 1917, follows:

Articles.	Purchased to—	
	Oct. 6, 1917.	Dec. 28, 1917.
Drawers, winter.....	13,360,813	25,150,332
Undershirts, winter.....	10,872,692	21,084,063
Gloves, woolen.....	4,600,697	11,349,664
Stockings, wool, light weight.....	11,621,534	31,754,373
Stockings, wool, heavy.....	7,922,068	21,130,088
Toques.....		2,825,000

In addition to the above large quantities of cotton drawers, undershirts, and stockings were purchased.

SHOES AND LEATHER.

It was the effort of this section to assist the Government in the expert knowledge necessary to make purchases in the most efficient manner. This necessitated the cooperation of shoe manufacturers, tanners, and all those producing the essential supplies in order to secure quantity and quality at a fair price; necessitated the standardizing and redrafting of specifications, and the incorporation of a new type of shoe more adequate for present-day war requirements.

In recommending the purchases of approximately 21,000,000 pairs of leather shoes attention is called to the following:

(a) The plan of a combination of competitive bidding for part and a fixed price for part made a saving to the Government of \$1,632,000 over the plan of strictly competitive bidding for the entire amount.

(b) In order to eliminate speculation on the purchase of materials, options were obtained on leather and supplies and guaranteed to the manufacturers at a fixed low price. This policy has permitted a net saving of approximately \$4,000,000.

(c) Original specifications called for calf, veal, or kip. The committee recommended a change to side leather, which was adopted, thereby increasing wearing service and resulting in a saving to the Government of \$806,000.

(d) Believing an Army shoe made with a drill lining was unsuitable for war requirements, a new model unlined shoe was recommended and adopted and has been more serviceable in every respect, at a reduction in cost, thereby permitting a saving of \$496,000.

(e) Total savings from the above suggestions approximated \$6,934,690.

RUBBER BOOTS AND ARCTICS.

In the recommending of purchases of rubber footwear advantage was taken of the total daily productive capacity of the country, and purchases recommended of the best quality produced at exceptionally low prices for delivery in accordance with needs in quantities as follows:

	Pairs.
Four-buckle arctics-----	2, 476, 000
Hip rubber boots-----	1, 500, 000
Short rubber boots-----	735, 000

MATERIAL FOR THE REPAIRING OF BOOTS AND SHOES.

Having in mind the repair of leather and rubber footwear in this country and in France, large purchases of the necessary materials were recommended for the deliveries needed at very low competitive prices, after most careful consideration and investigation. In this connection there were placed under specification, and recommended approximately 10,000,000 pairs of leather tap soles, 7,000,000 pairs of heel lifts, and 6,000,000 pairs of top lifts, and all other necessary materials in similar proportions.

LEATHER GAUNTLETS.

In a similar manner the purchases of approximately 2,500,000 pairs of gauntlets were recommended.

PURCHASES FOR ALLIED NATIONS.

Pursuing the same general policy the committee outlined purchases for Great Britain, France, Belgium, and Russia on the following articles totaling approximately \$40,000,000: Leather shoes, four-buckle arctics, hip rubber boots, short rubber boots, materials for the repair of leather shoes.

In outlining these allied purchases, materials or deliveries of the finished product were not allowed to in any way interfere with the needs of our own Government.

Recommendations according to the above approximate \$190,000,000. These have been made only after most careful investigation and exhaustive study.

MISCELLANEOUS.

COTS.

Purchases were authorized and made of 2,107,056 cots, of which 1,132,056 were canvas Army cots; 975,000 all-steel cots. The committee was instrumental in effecting the substitution of the superior and more economical all-steel cot.

AVIATORS' CLOTHING.

The Signal Corps requested the committee, early in September, to assist them in the clothing requirements for aviators and make recommendations as to where their requirements could best be taken care of, both as to price and deliveries. All official requests for such information were taken care of.

STATISTICS AND PRODUCTION.

This department was instituted in May, 1917, soon after the committee was authorized by the Secretary of War to assist the Quartermaster Corps in the purchase of certain items of clothing and equipment. The first work of this department was the collection from all available sources of the data necessary to the work of the committee on all contracts existing on May 1, together with the recording and summarizing of the same data on all contracts placed after May 1 on the recommendation of the committee.

Early in June, 1917, the system of recording data was in full operation, and the work of installing a production or "follow-up" system was commenced. At the same time the department started a system of charts, presenting graphically the relation between estimated requirements, contracts placed, etc.

The necessary forms and blanks for the "follow-up" work were started in July, 1917, and all contractors were at once notified to report, on forms supplied them for the purpose, first of deliveries made to date on each contract and thereafter weekly on the weekly shipments made on each contract.

The information thus obtained was tabulated and has been used as a basis for all "follow-up" work intending to increase deliveries and by the various purchasing divisions in determining the size of new contracts, etc. Weekly reports were also obtained from the various quartermaster depots, which were used as a check on the reports of the different contractors.

By August 1, 1917, the foundations of the committee's system were established, and since that time the system has expanded as additional articles were added to the list on which the committee was asked to advise.

The work at the time of the cessation of the committee's endeavors was divided into three main divisions with the following subdivisions:

1. Contracts:
 - (a) Authorizations from Quartermaster General.
 - (b) Contracts placed.
2. Production:
 - (a) Weekly report of each contract.
 - (b) Status of each contractor.
 - (c) Delinquencies and speeding up of production.

3. Statistics:

(a) Weekly report of work of committee.

(b) Charts.

How the work of this committee increased from the beginning can be shown by the following comparisons:

Original number of articles handled by the committee-----	19
Final number of articles handled by the committee-----	142
Number of contracts arranged for before May 1, 1917-----	625
Number of contracts arranged for May 1 to Dec. 22, 1917 (approximately)-----	4,650

The money value of the purchases totals approximately \$800,000,000 and the cost of the adjudication of this immense volume of business has been less than \$20,000.

Every effort was used, with the assistance of the various members of the committee, to prevent delinquencies and to hasten production. Any shortage of deliveries had to be adequately and immediately explained and overproduction was urged through letters, telegrams, and personal interviews. The total number of letters sent and received was approximately 80,000 and of telegrams approximately 10,000.

From all the various reports received the committee was able to tell at any time what had been accomplished.

GENERAL.

It was necessary for this committee to give some preference orders to manufacturers under section 120 of the act of June 3, 1916, in order to insure priority to Government contracts.

A number of lawsuits and contemplated legal actions, arising between civilian contractors and manufacturers and calculated to throttle the effectual delivery of merchandise to the Government were amicably adjusted.

More than 100 manufacturers, leaders in their respective lines, in conferences with several hundred others, assisted in the careful study of quartermaster specifications, resulting in skilled revision and modernization. The elimination of middlemen was largely accomplished.

Satisfactory results were achieved in assisting the Finance Bureau of the Quartermaster's Department in expediting payment to contractors. In many instances advantage was taken of cash discounts never before contemplated in Government purchases.

Cooperation was secured with the various agencies functioning on the settlement of labor difficulties.

The committee zealously attempted to assist those doing business with the Government by consistently directing all inquiries, which had been voluminous.

The efforts of this committee were helpful in securing fuel, machinery, raw materials, railroad, and express facilities for those Government contractors entitled to assistance.

A statement is appended of the larger items of purchases and receipts of material arranged for by the Committee on Supplies of the Council of National Defense up to January 12, 1918, at which time the work of the committee was taken over by the Quartermaster Department. (*The items on the left deal with the purchases made—those on the right with the goods that had been received by the Quartermaster Department up to Jan. 12, 1918.*)

	Purchased.	Received.
Cotton goods.....yards.....	363,511,000	167,875,000
Woolen cloths.....do.....	94,194,000	40,854,000
Underwear.....pieces.....	79,316,000	34,485,000
Stockings.....pairs.....	71,124,000	24,075,000
Shoes.....do.....	21,150,000	10,960,000
Wool shirts.....		8,340,000
Wool coats and breeches.....		7,978,000
Cotton coats and breeches.....		7,394,000
Hats, service.....	8,443,000	4,153,000
Gloves.....pairs.....	13,070,783	3,906,376
Leggins and puttees.....do.....	7,687,177	3,815,874
Blankets.....	19,553,000	7,640,000
Wool overcoats.....		2,919,000
Bed sacks.....	4,020,000	2,295,000
Cots.....	2,018,575	1,822,466
Shelter halves.....	3,913,000	1,332,000
Arctic overshoes.....	2,447,000	410,000
Moccasins.....	510,000	235,000
Rubber boots.....	2,235,000	267,000
Knitted togues.....	3,291,000	306,000
Pyramidal tents.....		191,000

In addition to the purchases of the main items of clothing and equipage, some of which are enumerated above, the Committee on Supplies assisted in the procurement of over 300 miscellaneous items. These covered a wide range and made possible the inauguration of the first reclamation units for the Army—hat, clothing, shoe and boot repair. The quantities reached in many instances large proportions. A few representative items, in round figures, are given below:

Waist belts.....	5,450,000
Half soles.....	15,000,000
Lifts.....	13,500,000
Heel plates.....	1,500,000
Nails, pounds.....	200,000
Pickax helves.....	375,000
Scrubbing brushes.....	855,000

COOPERATIVE COMMITTEE ON CARS.

The Cooperative Committee on Cars was created May 1, 1917, with Mr. S. M. Vauclain as chairman, its purpose being to ascertain and constantly keep before the Council of National Defense the war sit-

uation with regard to railroad cars from the builder's point of view, and thereby to regulate intelligently the building of cars and any necessary division of them between the United States and the Allied countries.

The committee held meetings, at which were discussed the subject of standardization of cars required by the United States Government for use in France, both standard-gauge cars for use on the railroads and narrow-gauge cars for use in the trenches. The details were developed and orders for the cars placed.

The committee has also aided the Army and Navy with regard to cars for heavy artillery, and has assisted the Belgian, Italian, and Russian Governments in the purchasing of cars in the United States.

The committee was disbanded on September 20, 1917, with the understanding that the chairman would keep in touch with the requirements.

COOPERATIVE COMMITTEE ON LOCOMOTIVES.

The Cooperative Committee on Locomotives was created May 1, 1917, with Mr. S. M. Vauclain as chairman, its purpose being to keep the Government constantly advised of the locomotive situation from the manufacturing point of view, to provide for an increased output as economically as possible, and to regulate the building of the locomotives and any necessary division of them between the United States and the Allies.

Numerous meetings were held in connection with designing and providing the necessary locomotives for the United States Government's use in France. Upon the completion of the designs and the placing of orders for these locomotives, the committee was disbanded on September 20, 1917, it being the understanding that the chairman would keep in touch with the general situation.

SUBCOMMITTEE ON ARMY AND NAVY ARTILLERY.

The Subcommittee on Army and Navy Artillery was created on April 19, 1917, with Mr. S. M. Vauclain as chairman, as the Committee on Mobile Artillery, by the General Munitions Board, the change in name being effected on April 28, 1917, "in order that greater convenience and effectiveness in the work may be obtained." Its purpose was to work out the questions of increasing the capacity of this country in big-gun forging and big-gun machining.

Meetings were held at intervals. Requirements for the Army and Navy were discussed and the best methods to meet these needs.

Existing firms capable of producing requirements of the Army and Navy were communicated with and inventory made of their equipment, capacity, and possible expansion.

Recommendations were made for and against giving financial assistance to manufacturers to enable them to take on Government contracts, and further recommendations were made for the establishment of new facilities to meet the varied and urgent needs.

Having completed the work for which it was established, the committee was released from further duty and disbanded September 20, 1917.

**ORGANIZATION OF THE COUNCIL OF NATIONAL DEFENSE, ITS ADVISORY
COMMISSION, AND THE BOARDS, SECTIONS, AND COMMITTEES
UNDER THE COUNCIL AND ADVISORY COMMISSION.**

COUNCIL OF NATIONAL DEFENSE.

Secretary of War, **NEWTON D. BAKER**, Chairman.
Secretary of the Navy, **JOSEPHUS DANIELS**.
Secretary of the Interior, **FRANKLIN K. LANE**.
Secretary of Agriculture, **DAVID F. HOUSTON**.
Secretary of Commerce, **WILLIAM C. REDFIELD**.
Secretary of Labor, **WILLIAM B. WILSON**.

JUNE 30, 1918.

ADVISORY COMMISSION OF COUNCIL OF NATIONAL DEFENSE.

EL WILLARD, transportation and communication (president Baltimore & O Railroad), chairman.
ROBERT E. COFFIN, munitions and manufacturing (including standardization) industrial relations; vice president Hudson Motor Co.
JOSEPH S. ROSENWALD, supplies (including clothing), etc.; president Sears, Roebuck & Co.
HERBERT M. BARUCH, raw materials, minerals, and metals; banker.
WILLIAM COLLIS GODFREY, engineering and education; president Drexel Institute.
JOHN P. GOMPERS, labor, including conservation of health and welfare of workers; president American Federation of Labor.
FRANKLIN MARTIN, medicine and surgery, including general sanitation; secretary-general American College of Surgeons, Chicago.

EXECUTIVE OFFICE OF COUNCIL AND ADVISORY COMMISSION.

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LEONOR B. CLARKSON, secretary of Council and Advisory Commission.
JOHN CE. N. HITCHCOCK,¹ assistant secretary of Council and Advisory Commission.

R. PYNE, 2d, assistant to director and business manager.
ROBERT H. WILLIAMS, Jr.,² assistant to director.
FRITZ L. CRAWFORD, assistant to director.
JOHN E. F. PORTER,¹ assistant to director.
JOHN DON DAVIE,¹ assistant to director.
WILLIAM L. CATCHINGS,² assistant to director.
WILLIAM ELLSWORTH, chief clerk.
EDWARD P. AYRES,¹ statistician.

¹ Resigned previous to June 30, 1918, to enter military service.

² Resigned November, 1917.

SUBORDINATE BODIES OF THE COUNCIL OF NATIONAL DEFENSE.

(As of June 30, 1918.)

STATE COUNCILS SECTION.

Arthur H. Fleming, chief.

John S. Cravens, assistant chief.	D. M. Reynolds.
Carl L. Buehl, secretary.	Henry M. Robinson.
Frederick L. Allen.	James A. B. Scherer. ¹
Horace A. Davis.	Benjamin P. Selby.
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Mrs. Stanley McCormick, chairman Department of Food Production and Home Economics.

Mrs. Joseph R. Lamar, chairman Department of News and Food Administration.

Miss Agnes Nestor, chairman Department of Women in Industry.

Miss Hannah J. Patterson, resident director and chairman Department of Registration.

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Mrs. Martha Evans Martin, executive chairman Educational Propaganda.

Miss Helen Atwater, executive chairman Food Production and Home Economics.

Mrs. Allene Wilkes, executive chairman News.

Mrs. Samuel Bannister Harding, executive chairman Women in Industry.

Mrs. Helen Gulick, assistant, Child Welfare.

Mrs. Bertha C. Gordon, assistant Educational Propaganda.

Miss Ruth Wilson, assistant State Organization.

Miss Grace M. Speir, assistant to the Resident Director.

Miss Elizabeth Green, head of the Information Department.

Miss Adah E. Bush, Office Manager.

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George H. Pride.

Henry G. Shirley.

Robert C. Hargreaves, secretary.

Raymond Beck.

L. L. Robinson.

J. Clyde Marquis.

¹ Resigned June 24, 1918.

NATIONAL RESEARCH COUNCIL.

(Organized as the Department of Science and Research of the Council of National Defense.)

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DIVISION OF AGRICULTURE, BOTANY, FORESTRY, ZOOLOGY, AND FISHERIES.

Vernon Kellogg.

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Dr. M. R. Hutchinson.	Dr. W. R. Whitney.
B. G. Lamme.	Dr. R. S. Woodward.

SION.

(As of June 30, 1918.)

COMMITTEES ON EDUCATION OF THE ADVISORY COMMISSION.

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 Trenton, N. J.
 Alva O. Neal, State high-school inspector, University of Arizona, Tucson, Ariz.
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 mingham, Ala.
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 J. D. Shoop, A. M., LL. D., city superintendent of education, Chicago, Ill.
 Payson Smith, A. M., LL. D., Litt. D., State commissioner of education, Boston,
 Mass.
 Frank V. Thompson, A. B., assistant superintendent of schools, Boston, Mass.
 Will C. Woods, commissioner of secondary schools, Sacramento, Cal.

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 J. Y. Joyner, State superintendent of education, Raleigh, N. C.
 P. P. Claxton, Commissioner of Education, ex officio member.

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COMMITTEE ON LABOR.

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 chairman.
 William B. Wilson, Secretary of Labor, Washington, D. C.
 V. Everit Macy, president the National Civic Federation, New York City.
 James Lord, president Mining Department, American Federation of Labor,
 Washington, D. C.
 Elisha Lee, general manager Pennsylvania Railroad Co., Philadelphia, Pa.
 Warren S. Stone, grand chief Brotherhood of Locomotive Engineers, Cleveland,
 Ohio.
 C. E. Michael, National Association of Manufacturers, president Virginia
 Bridge & Iron Co., Roanoke, Va.
 Frank Morrison, secretary American Federation of Labor, Washington, D. C.
 Leo K. Frankel, third vice president Metropolitan Life Insurance Co., New
 York City.
 James O'Connell, president Metal Trades Department, American Federation
 of Labor, Washington, D. C.
 Louis B. Schram, chairman labor committee United States Brewers' Associa-
 tion, Brooklyn, N. Y.
 Ralph M. Easley, assistant to Samuel Gompers as chairman of committee,
 New York City.
 James W. Sullivan, assistant to Samuel Gompers as member of advisory com-
 mission. Washington, D. C.
 Mrs. Ralph M. Easley, New York City Secretary.

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Benjamin Ide Wheeler, president University of California, Berkeley, Cal.

H. B. F. Macfarland, publicist, Washington, D. C.

Harry Pratt Judson, president University of Chicago, Chicago, Ill.

Edgar A. Bancroft, attorney, Chicago, Ill.

Theodore Marburg, publicist, Baltimore, Md.

John B. McPherson, secretary New England Civic Federation, Boston, Mass.

W. Z. Ripley, professor of political economy, Harvard University, Cambridge, Mass.

Robert Bass, Peterboro, N. H.

John H. Finley, New York State Commissioner of Education, Albany, N. Y.

Jeremiah W. Jenks, Alexander Hamilton Institute, New York City.

William J. Schieffelin, chairman joint board of sanitary control, New York City.

Ralph M. Easley, chairman executive council National Civic Federation, New York City.

Rabbi Stephen S. Wise, Fifty-seventh Street and Seventh Avenue, New York City.

Harden L. Crawford, banker, New York City.

J. C. Walber, secretary Bureau of Information of Eastern Railways, New York City.

J. G. Schmidlapp, Cincinnati, Ohio.

Myron T. Herrick, former ambassador to France, Cleveland, Ohio.

Clinton Rogers Woodruff, secretary National Municipal League, Philadelphia, Pa.

Col. J. L. Spangler, Bellefonte, Pa.

Henry De Bardeleben, president Alabama Coal & Iron Co., Birmingham, Ala.

Joseph D. Grant, Burlingame, Cal.

William H. Crocker, president Crocker National Bank, San Francisco, Cal.

Harris Weinstock, president Weinstock, Nichols Co., San Francisco, Cal.

Isaac Ullman, president New Haven Chamber of Commerce, New Haven, Conn.

A. G. Haskell, E. I. Du Pont De Nemours Powder Co., Wilmington, Del.

Charles P. Neill, manager Bureau of Information, Southeastern Railways, Washington, D. C.

Hale Holden, president Chicago, Burlington & Quincy Railroad Co., Chicago, Ill.

J. W. Higgins, secretary Western Presidents' Conference, Chicago, Ill.

Charles G. Dawes, president Central Trust Co. of Illinois, Chicago, Ill.

B. A. Eckhart, president B. A. Eckhart Milling Co., Chicago, Ill.

H. M. Byllesby (substitute for G. H. Harries), Chicago, Ill.

Edward Hamlin, president Metropolitan Coal Co., Boston, Mass.

W. T. Barbour, Detroit, Mich.

August Belmont, New York City.

Nicholas F. Brady, president New York Edison Co., New York City.

John D. Rockefeller, jr., New York City.

E. H. Outerbridge, president New York Chamber of Commerce, New York City.

Emerson McMillan, president American Light & Traction Co., New York City.

P. E. Crowley, vice president New York Central Lines, New York City.

A. Parker Nevin, general counsel National Association of Manufacturers, New York City.

James A. Hatch, Johnson & Higgins, New York City.

Andrew C. Imbrie, treasurer United States Finishing Co., New York City.

D. Q. Brown, Tide Water Oil Co., New York City.

Daniel Guggenheim, president American Smelting & Refining Co., New York City.

E. T. Stotesbury, Drexel & Co., Philadelphia, Pa.

William H. Johnson, president Machinists, American Federation of Labor Building, Washington, D. C.

L. E. Sheppard, vice president Order of Railway Conductors, Washington, D. C.

John R. Alpine, general president United Association of Plumbers and Steamfitters, Chicago, Ill.

Oscar Nelson, post-office clerk, Chicago, Ill.

G. C. Van Dormas, general vice president Blacksmiths' Union, Chicago, Ill.

F. G. Purtill, vice chairman Brotherhood Locomotive Firemen and Enginemen, Duquoin, Ill.

Paul Bennett, president powder workers, Coalmont, Ind.

J. E. McClory, president Structural Iron Workers, American Central Life Building, Indianapolis, Ind.

J. P. McCreery, vice president Railway Carmen, Paducah, Ky.

William Diamond, Mine Workers, Cumberland, Md.

W. D. Mahon, president Amalgamated Association of Street Electric Railway Employees, Detroit, Mich.

Henry B. Perham, president Railroad Telegraphers, St. Louis, Mo.

Collis Lovely, vice president Boot and Shoe Workers, St. Louis, Mo.

D. D'Alessandro, president Hod Carriers, Albany, N. Y.

J. J. Frell, president Stereotypers' Union, Brooklyn, N. Y.

S. E. Heberling, president Switchmen's Union, Buffalo, N. Y.

Thomas U. Curtis, tunnel and subway constructor, New York City.

Stephen C. Hogan, general president Marble Workers, New York City.

Thomas A. Rickert, president United Garment Workers, New York City.

Joseph F. Valentine, president International Molders' Union, Cincinnati, Ohio.

William P. Clarke, president Flint Glass Workers, Toledo, Ohio.

SUBCOMMITTEE ON WAGES AND HOURS.

Frank Morrison, secretary American Federation of Labor, Washington, D. C., chairman.

John R. Alpine, general president United Association of Plumbers and Steamfitters, Chicago, Ill.

Frank C. Armstrong, president Ray Hercules Copper Co., New York City.

C. L. Baine, secretary-treasurer Boot and Shoe Workers Union, Boston, Mass.

Albert Farwell Bemis, president National Association of Cotton Manufacturers, Boston, Mass.

M. E. Bryan, general president International United Brotherhood of Leather Workers on Horse Goods, Kansas City, Mo.

W. S. Carter, president Brotherhood of Locomotive Firemen and Enginemen, Peoria, Ill.

Harry Cohn, chairman Cloak, Suit, and Skirt Manufacturers Protective Association, New York City.

Wm. K. Field, president Pittsburgh Coal Co., Pittsburgh, Pa.

Felix Frankfurter, Harvard University, Cambridge, Mass.

John Golden, general president United Textile Workers of America, New York City.

Daniel Guggenheim, president American Smelting & Refining Co., New York City.

Hale Holden, president Chicago, Burlington & Quincy Railroad Co., Chicago, Ill.

- Wm. L. Hutcheson, president United Brotherhood of Carpenters and Joiners, Indianapolis, Ind.
- Wm. H. Johnston, president International Association of Machinists, Washington, D. C.
- Frank J. McNulty, president International Brotherhood of Electrical Workers, Springfield, Ill.
- T. V. O'Connor, president International Longshoremen's Association, Buffalo, N. Y.
- George Pope, president National Association of Manufacturers, Hartford, Conn.
- Thomas A. Rickert, president United Garment Workers of America, New York City.
- Joseph F. Valentine, president International Molders' Union of North America, Cincinnati, Ohio.
- A. O. Wharton, president Railway Employees Department, American Federation of Labor, Washington, D. C.
- John Williams, president Amalgamated Association of Iron, Steel and Tin Workers, Pittsburgh, Pa.
- A. J. Berres, secretary-treasurer Metal Trades Department, Washington, D. C.
- A. Caminetti, Department of Labor, Washington, D. C.
- John Donlin, president Building Trades Department, Washington, D. C.
- William Green, secretary-treasurer United Mine Workers of America, Indianapolis, Ind.
- W. D. Mahon, president International Association of Street and Electric Railways, Detroit, Mich.
- V. Everit Macy, president Civic Federation, New York City.
- Wm. J. Spencer, secretary-treasurer Building Trades Department, Washington, D. C.
- Wm. W. Woods, president American Woolen Co., Boston, Mass.

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- Mrs. Frederick Bagley, Washington, D. C., and New York.
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 Prof. Walter F. Willcox, Ithaca, N. Y.
 Representative of Surgeon General of the Army.

Tuberculosis:

Herman M. Biggs, M. D., New York City, chairman.
 Edward R. Baldwin, M. D., Saranac Lake, N. Y.
 Lawrason Brown, M. D., Saranac Lake, N. Y.
 Col. George E. Bushnell, Medical Corps, United States Army, Wash-
 ton, D. C.
 Homer Folks, M. D., New York City.
 Charles R. Grandy, M. D., Norfolk, Va.
 George T. Palmer, M. D., Springfield, Ill.
 Asst. Surg. Gen. John W. Trask, United States Public Health Service,
 Washington, D. C.

Venereal diseases:

William F. Snow, M. D., New York City, chairman.
 Haven Emerson, M. D., New York City.
 Raymond B. Fosdick, New York City.
 Jerome D. Greene, New York City.
 Surg. Richmond C. Holcomb, United States Navy, Washington, D. C.
 Edward L. Keyes, jr., M. D., New York City.
 Col. L. M. Maus, Medical Corps, United States Army, Washington, D. C.
 Hans Zinsser, M. D., New York City.
 William Zinsser, New York City.

COMMITTEE ON INDUSTRIAL MEDICINE AND SURGERY.

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 Magnus Alexander, West Lynn, Mass.
 Carl L. Alsberg, M. D., Washington, D. C. (Department of Agriculture).
 W. H. Davis, M. D., Washington, D. C. (Department of Commerce).
 Otto P. Geier, M. D., Cincinnati, Ohio.
 Van H. Manning, Washington, D. C. (Department of the Interior).
 Charles H. Mayo, M. D., Rochester, Minn.
 Royal Meeker, Washington, D. C. (Department of Labor).
 Harry E. Mock, M. D., Washington, D. C.
 Thomas F. Logan, Washington, D. C.

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 J. M. T. Finney, M. D., Baltimore, Md.
 Edward Martin, M. D., Philadelphia, Pa.
 Charles H. Mayo, M. D., Rochester, Minn.
 Col. William O. Owen, Medical Corps, United States Army, Washington, D. C.
 George H. Simmons, M. D., Chicago, Ill.
 William H. Welch, M. D., Baltimore, Md.
 Gordon Wilson, M. D., Baltimore, Md.

COMMITTEE ON MEDICAL ADVISORY BOARDS.

Edward Martin, M. D., Philadelphia, Pa., chairman.
 John D. McLean, M. D., Philadelphia, Pa., secretary.
 Alexander R. Craig, M. D., Chicago, Ill.
 Robert L. Dickinson, M. D., Brooklyn, N. Y.
 Malcolm L. Harris, M. D., Chicago, Ill.
 Charles H. Mayo, M. D., Rochester, Minn.
 F. F. Simpson, M. D., Pittsburgh, Pa.
 Hubert Work, M. D., Pueblo, Colo.

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Joseph M. Flint, M. D., New Haven, Conn., chairman.
 Thomas W. Huntington, M. D., San Francisco, Cal.
 Edward Martin, M. D., Philadelphia, Pa.
 Charles H. Peck, M. D., New York City.
 Winford H. Smith, M. D., Baltimore, Md.
 Frederick A. Washburn, M. D., Boston, Mass.

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 S. S. Goldwater, M. D., New York City.
 Miss Annie W. Goodrich, New York City.
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 Miss Julia C. Lathrop, Washington, D. C.
 Miss Clara D. Noyes, Washington, D. C.
 Winford H. Smith, M. D., Baltimore, Md.
 Miss Dora L. Thompson, United States Army, Washington, D. C.
 Miss Lillian D. Wald, New York City.
 William H. Welch, M. D., Baltimore, Md.
 Prof. C. E. A. Winslow, New Haven, Conn.

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 William C. Woodward, M. D., Washington, D. C., vice chairman.
 Hubert A. Royster, M. D., Raleigh, N. C., secretary.
 Frederic A. Besley, M. D., Chicago, Ill.
 Thomas W. Huntington, M. D., San Francisco, Cal.
 Edward Martin, M. D., Philadelphia, Pa.
 Winford H. Smith, M. D., Baltimore, Md.

COMMITTEE ON RESEARCH.

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 George W. Crile, M. D., Cleveland, Ohio.
 George E. Hale, M. D., Pasadena, Cal.
 Richard P. Strong, M. D., Boston, Mass.
 William H. Welch, M. D., Baltimore, Md.

COMMITTEE ON STATES ACTIVITIES.

Edward Martin, M. D., Philadelphia, Pa., chairman.
 John D. McLean, M. D., Philadelphia, Pa., secretary.
 Joseph C. Bloodgood, M. D., Baltimore, Md.
 John Young Brown, M. D., St. Louis, Mo.
 Karl Connell, M. D., New York City.
 George W. Crile, M. D., Cleveland, Ohio.
 Richard Derby, M. D., New York City.
 J. M. T. Finney, M. D., Baltimore, Md.
 Joseph M. Flint, M. D., New Haven, Conn.
 Henry D. Jump, M. D., Philadelphia, Pa.
 William J. Mayo, M. D., Rochester, Minn.
 Stuart McGuire, M. D., Richmond, Va.
 Col. Reuben Miller, Medical Corps, United States Army, Washington, D. C.
 Brig. Gen. Robert E. Noble, Medical Corps, United States Army, Washington D. C.
 Charles H. Peck, M. D., New York City.
 Hubert A. Royster, M. D., Raleigh, N. C.
 Frederick T. Van Beuren, jr., M. D., New York City.

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 Edward Martin, M. D., Philadelphia, Pa., first vice chairman.
 Rotating surgical advisor attached to Office of Surgeon General of the Army,
 second vice chairman.
 Col. William H. Moncrief, Medical Corps, United States Army, Washington,
 D. C., secretary.
 John F. Binnie, M. D., Kansas City, Mo.
 George E. Brewer, M. D., New York City.
 John G. Clark, M. D., Philadelphia, Pa.
 George W. Crile, M. D., Cleveland, Ohio.
 John B. Deaver, M. D., Philadelphia, Pa.
 M. T. Finney, M. D., Baltimore, Md.
 Ellen B. Kanavel, M. D., Chicago, Ill.
 Charles B. Penrose, M. D., Philadelphia, Pa.
 Hubert A. Royster, M. D., Raleigh, N. C.
 J. Bentley Squier, M. D., New York City.

SUBCOMMITTEES OF COMMITTEE ON SURGERY.

Classification of Surgeons:

Charles B. Penrose, M. D., Philadelphia, Pa., chairman.
 John G. Clark, M. D., Philadelphia, Pa.
 John B. Deaver, M. D., Philadelphia, Pa.
 J. Bentley Squier, M. D., New York City.

Ophthalmology:

James Bordley, jr., M. D., Baltimore, Md., chairman.
 Charles Bagley, jr., M. D., Baltimore, Md.
 Nelson Miles Black, M. D., Milwaukee, Wis.
 Allen Greenwood, M. D., Boston, Mass.
 Walter R. Parker, M. D., Detroit, Mich.
 George E. de Schweinitz, M. D., Philadelphia, Pa.
 William H. Wilmer, M. D., Washington, D. C.

Otology, Rhinology, and Laryngology:

Charles W. Richardson, M. D., Washington, D. C., chairman.
 Vilray P. Blair, M. D., St. Louis, Mo.
 Joseph H. Bryan, M. D., Washington, D. C.
 Lieut. Col. Theodore C. Lyster, Medical Corps, United States Army, Wash-
 ington, D. C.
 Harris P. Mosher, M. D., Boston, Mass.
 Surg. George B. Triple, United States Navy, Washington, D. C.

COMMITTEE OF WOMEN PHYSICIANS.

Josalie Slaughter Morton, M. D., New York City, chairman.
 Cornelia C. Brant, M. D., Brooklyn, N. Y.
 Adelaide Brown, M. D., San Francisco, Cal.
 Emma V. P. B. Culbertson, M. D., Boston, Mass.
 Mary Lapham, M. D., Highlands, N. C.
 Marion Craig Potter, M. D., Rochester, N. Y.
 Caroline Purnell, M. D., Philadelphia, Pa.
 Florence N. Ward, M. D., San Francisco, Cal.

COMMITTEE ON STANDARDIZATION OF MEDICAL AND SURGICAL SUPPLIES AND
 EQUIPMENT.

Frank F. Simpson, M. D., chairman.
 W. Crile, M. D., Cleveland, Ohio.

Harvey Cushing, M. D., Boston, Mass.
Lieut. Col. Carl R. Darnall, M. D., Washington, D. C.
Charles L. Gibson, M. D., New York City.
Richard H. H. Harte, M. D., Philadelphia.
Col. Jefferson R. Kean, M. D., Washington, D. C.
Joseph A. Murphy, M. D., Washington, D. C.
Henry S. Plummer, M. D., Rochester, Minn.
Asst. Surg. Gen. W. C. Rucker, U. S. P. H. S., Washington, D. C.
T. W. Richards, M. D., United States Navy, secretary.

THE WAR INDUSTRIES BOARD AND ITS SUBORDINATE AGENCIES.

(AS OF MAY 28, 1918, THE DATE OF THE EXECUTIVE ORDER SEPARATING THE BOARD FROM THE COUNCIL OF NATIONAL DEFENSE.)

WAR INDUSTRIES BOARD.

B. M. BARUCH, chairman.

ROBERT S. BROOKINGS.	GEORGE N. PEEK.
Brig. Gen. HUGH S. JOHNSON.	J. L. REFLOGLE.
Rear Admiral F. F. FLETCHER.	L. L. SUMMERS.
HUGH FRAYNE.	ALEXANDER LEGGE.

EDWIN B. PARKER.

H. P. INGELS, secretary.

W. W. PHELPS, assistant secretary.

PRICE FIXING COMMITTEE.

Robert S. Brookings, chairman.
B. M. Baruch, ex officio.
W. B. Colver, United States Federal Trade Commission.
H. A. Garfield, United States Food Administration.
F. W. Taussig, United States Tariff Commission.
Col. F. W. Young, United States Army.
Hugh Frayne, Labor Division, War Industries Board.
Commander John M. Hancock, United States Navy.
W. W. Phelps, acting secretary.

LABOR DIVISION.

Hugh Frayne, chairman.

ALLIED PURCHASING COMMISSION.

James A. Carr, business manager.
A. L. Bostwick.
James C. Leddy.
F. E. Penick.

REQUIREMENTS DIVISION.

Alexander Legge, chairman.
B. M. Baruch, ex officio.
Judge Edwin B. Parker.
George N. Peek.
J. Leonard Replogle.
L. L. Summers.
Pope Yeatman.

Col. George H. Estes, Army representative.
 Capt. M. N. Taylor, Navy representative, construction division.
 Admiral C. J. Peoples, Navy representative.
 J. L. Ackerson, Emergency Fleet representative.
 T. F. Whitmarsh, Food Administration representative.
 M. B. Poole, Red Cross representative.
 T. C. Powell, Railroad Administration representative.
 James A. Carr, representing the Allied Purchasing Commission.
 James Inglis, executive secretary.

PRIORITIES DIVISION.

Edwin B. Parker, commissioner.

Charles K. Foster, vice chairman.	Rear Admiral N. E. Mason.
Maj. Gen. J. B. Aleshire.	Col. W. W. Gibson.
George Armsby.	Everett Morss.
H. H. Barbour.	Lucius P. Ordway.
Charles P. Howland.	T. C. Powell.
F. H. Macpherson.	Rear Admiral A. V. Zane.

Maurice Hirsh, secretary.

PRIORITIES BOARD.

Edwin B. Parker, priorities commissioner, chairman.
 Edward Chambers, director of traffic of the Railroad Administration.
 Charles R. Piez, vice president and general manager of the Emergency Fleet Corporation (representing the U. S. Shipping Board as well as the Emergency Fleet Corporation).
 Clarence W. Woolley, member of the War Trade Board.
 P. B. Noyes, representing the Fuel Administration.
 T. F. Whitmarsh, representing the Food Administration.
 Alex. Legge, representing the allied purchasing commission.
 Rear Admiral Frank F. Fletcher, representing the United States Navy.
 Maj. Gen. George E. Goethals, representing the United States Army.
 Bernard M. Baruch, chairman of the War Industries Board, *ex officio*.
 H. G. Phillipps, secretary.

CLEARANCE COMMITTEE.

Rear Admiral Frank F. Fletcher, chairman.
 Clarence D. Kerr, secretary.

FINISHED PRODUCTS DIVISION.

George N. Peek, director of finished products.
 E. L. Crawford, assistant commissioner.
 Stanley Williamson, assistant.

CONSERVATION DIVISION.

A. W. Shaw, chairman.

Charles K. Foster.	George N. Peek.
Gen. H. S. Johnson.	T. C. Powell.
C. H. McDowell.	Pope Yeatman.

Admiral Samuel McGowan.
 Melvin T. Copeland, executive secretary.

COMMODITY DIVISIONS AND SECTIONS.

RAW MATERIALS.

(Each commodity section includes in its membership representatives of the Army, Navy, Emergency Fleet Corporation, or other Government department interested in the supply of that particular commodity.)

STEEL.

J. Leonard Replogle, director of steel supply.
 F. Purnell. P. Mackall.
 J. C. McLauchlan. F. E. Thompson.

TIN.

George N. Armsby, chief. Lincoln Hutchinson, expert.

NONFERROUS METALS.

Pope Yeatman, chief. E. C. Thurston, assistant.

COTTON AND COTTON LINTERS.

George R. James, chief.
 Spencer Turner, executive director. Grosvenor Ely.

LUMBER.

R. H. Downman, chief.
 Charles Edgar. Frank H. Ransom.
 Charles H. Worcester. C. J. Winton.
 Walter E. Chamberlin. Earl A. Smith, secretary.

WOOL.

Lewis Penwell, chief. A. W. Elliott.

CHEMICALS AND EXPLOSIVES DIVISION.

Leland L. Summers, director.
 Charles H. MacDowell, assistant, and chief nitrates section.
 A. R. Brunker, chief, acids and heavy chemicals section.
 Russell S. Hubbard, associate, acids and heavy chemicals section.
 A. E. Wells, associate, acids and heavy chemicals section.
 H. G. Carrell, chief, alkali and chlorine section.
 R. M. Torrènce, chief, chemical glass and stoneware section.
 J. M. Morehead, chief, coal-gas products section.
 Ira C. Darling, chief, creosote section.
 William G. Woolfolk, chief, sulphur, alcohol, and pyrites section.
 Hugh W. Sanford, chief, ferro-alloys section.
 C. D. Tripp, associate, ferro-alloys section.
 A. G. Rosengarten, chief, fine chemicals section.
 J. A. Becker, associate, nitrates section.
 H. Ray Paige, associate, nitrates section.
 Russell S. Hubbard, chief, paint and pigment section.
 C. H. Conner, chief, platinum section.
 E. J. Haley, chief, tanning materials section.
 E. A. Prosser, associate, tanning materials section.
 Dr. S. A. Tucker,
 Dr. E. R. Weldlein,
 Dr. H. R. Moody,
 Capt. A. G. Stillwell, } technical and consulting section.

C. H. Conner, chief, wood distillation products section.
 A. H. Smith, associate, wood distillation products section.
 H. J. Adams, chief, mica section.

JOINT OFFICE ON CHEMICAL STATISTICS.

Lieut. M. R. Gordon (Army).
 Asst. Paymaster R. P. Dunning (Navy).
 Lieut. Willis B. Rice.
 Arthur Minnick.

FINISHED PRODUCTS.

AGRICULTURAL IMPLEMENTS.

E. E. Parsonage, chief. P. B. Schravessande, assistant.

AUTOMOTIVE PRODUCTS.

H. L. Horning, chief.
 H. J. Adams, assistant. Coker F. Clarkson.

BRASS AND COPPER TUBING.

Everett Morss, chief.

CHAIN.

John C. Schmidt, chief. Arthur E. Crockett, assistant.

CRANE.

Alexander C. Brown, chief.
 L. P. Lipps, assistant. Capt. L. E. Stamp, assistant.

ELECTRIC AND POWER EQUIPMENT.

Walter Robbins, chief.
 L. W. Grothaus, assistant. M. M. Hughes, assistant.

FELTS.

Sylvan Stroock.

HIDES AND LEATHER.

C. F. C. Stout, chief.

Maj. Joseph C. Byron. E. C. Shotwell.
 Henry W. Boyd. E. J. Haley.
 Fred A. Vogel.

LINEN THREAD.

George F. Smith, chief. Harry Kennedy, assistant.

MACHINE TOOLS.

G. E. Merryweather, chief.
 A. B. Einig. R. J. Houck.
 A. J. Baker. E. D. Crockett.

OPTICAL GLASS.

George E. Chatillon, chief.

PAINT.

Russell S. Hubbard, chief. L. R. Atwood, associate.

SMALL TOOLS.

Murray Sargent, acting chief.

SUPPLIES.

Spencer Turner, chief.
Grosvenor Ely, assistant. George F. Smith.
Lincoln Cromwell. Sylvan Stroock.
A. W. Lawrence.

TOBACCO.

A. I. Esberg, chief.

WIRE AND CABLE.

Leroy Clark, chief.

STORED MATERIALS DIVISION.

John F. Wilkins, chief.

STORAGE COMMITTEE.

James Inglis, chairman. P. E. Foederer, vice chairman.

PRODUCTION DIVISION.

S. M. Vauclain, chairman.
Henry R. Rea. G. M. Shaw.
Frank W. Morse. Col. D. C. Seagraves.
Admiral A. R. Couden. E. F. Wood.
J. M. Hansen, secretary.

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Col. W. A. Starrett, chairman.
Frederick Law Olmsted. Maj. C. Foster, Eng.
John Donlin. W. F. Long.
Lieut. J. B. Talmage, secretary.

LEGAL SECTION.

Robert J. Bulkley, chief. Herbert A. Friedlich.
Wilford C. Saeger. Frank T. Nelson.
Henry M. Channing. Edwin M. Dodd, jr.
Charles W. McKelvey. Durand H. Van Doren.

POWER SECTION.

Frederic Darlington.
Maj. C. F. Lacombe, Engineer Reserve Corps.
Maj. George F. Sever, Engineer Reserve Corps.
Capt. John C. Damon, Engineer Reserve Corps.
Maj. Malcolm MacLaren, Engineer Reserve Corps.
Capt. Carroll H. Shaw, Engineer Reserve Corps.
Capt. A. M. Tinsley, Engineer Reserve Corps.
Lieut. Charles B. Lehmer, Engineer Reserve Corps.
Lieut. George K. Miltenberger, Engineer Reserve Corps.
Lieut. W. W. Stanley, Ordnance Reserve Corps.

FIRE PREVENTION SECTION.

W. H. Merrill, chairman.

Frank L. Pierce.
W. E. Mallalieu.

George W. Booth.
Charles H. Smith.

**SUBORDINATE AGENCIES OF THE COUNCIL AND ADVISORY COMMISSION
DISSOLVED OR TRANSFERRED TO OTHER JURISDICTION DURING
THE FISCAL YEAR ENDING JUNE 30, 1918.**

DIVISION OF STATISTICS.

(Transferred in part to the General Staff, U. S. A., in part to the War Industries Board.)

Leonard P. Ayres, chief.

W. Randolph Burgess.

Mills E. Case.

COMMERCIAL ECONOMY BOARD.

(Dissolved May 9, 1918, when its work was assumed by the newly organized Conservation Division of the War Industries Board.)

A. W. Shaw, president A. W. Shaw Co., chairman.

W. D. Simmons, president Simmons Hardware Co.

E. F. Gay, dean of the Graduate School of Business Administration, Harvard University.

George Rublee, member of Eight-Hour Commission.

Henry S. Dennison, president Dennison Manufacturing Co.

Dr. Hollis Godfrey, member ex officio.

Alfred Pittman, assistant to chairman.

Melvin T. Copeland, secretary.

AIRCRAFT PRODUCTION BOARD.

(Separated from the Council of National Defense by act of Congress in October, 1917, to become the Aircraft Board.)

Howard E. Coffin, chairman.

Brig. Gen. George O. Squier, Chief Signal Officer United States Army.

Rear Admiral David W. Taylor, Bureau of Construction, United States Navy.

S. D. Waldon, ex-vice President of the Packard Motor Car Co.

E. A. Deeds, Engineering Laboratories, Dayton, Ohio.

R. L. Montgomery, Montgomery, Clothier & Tyler, bankers, Philadelphia, Pa.

Arthur G. Cable, secretary.

COMMITTEE ON COAL PRODUCTION.

(Dissolved Feb. 25, 1918.)

F. S. Peabody, president Peabody Coal Co., Chicago, chairman.

William Green, secretary United Mine Workers of America, Indianapolis, secretary.

George W. Reed, Peabody Coal Co., Chicago, assistant secretary.

Herbert Addison, vice president Big Horn Collieries Co., Denver.

F. C. Baird, secretary Lake Erie Bituminous Coal Exchange, Cleveland.

E. J. Berwind, president Berwind-White Coal Mining Co., New York.

E. B. Chase, Berwind-White Coal Mining Co., Philadelphia.

William Diamond, United Mine Workers of America, Washington.

George W. Elliott, secretary National Committee on Gas and Electric Service, Washington.

Robert H. Harlin, International Executive Board.

Frank Hayes, vice president United Mine Workers of America, Indianapolis.

W. W. Keefer, president, Pittsburgh Terminal Railroad & Coal Co., Pittsburgh.

H. L. Kerwin, secretary to the Secretary of Labor, Washington.

John L. Lewis, statistician United Mine Workers of America, Indianapolis.

James Lord, president mining department American Federation of Labor, Washington.

Van. H. Manning, director, Bureau of Mines, Washington.

John Mitchell, chairman Industrial Commission of the State of New York, New York City.

C. M. Moderwell, president United Coal & Mining Co., Chicago.

Rembrandt Peale, chairman Tidewater Coal Exchange, New York City.

Erschine Ramsey, vice president Pratt Consolidated Coal Co., Birmingham, Ala.

Roy A. Rainey, W. J. Rainey Estate, New York City.

George Otis Smith, director United States Geological Survey, Washington.

James J. Storrow, chairman Massachusetts Committee on Public Safety, Boston.

Lucius S. Storrs, president The Connecticut Co., New Haven.

H. N. Taylor, vice president Central Coal & Coke Co., Kansas City, Mo.

S. D. Warriner, president Lehigh Valley Coal & Navigation Co., Philadelphia.

J. F. Wellborn, president Colorado Fuel & Iron Co., Denver.

Daniel B. Wentz, president Stonega Coal & Coke Co., Philadelphia.

John P. White, president United Mine Workers of America, Indianapolis.

COMMITTEE ON HOUSING.

(Temporary committee acting during November, December, and January.)

Otto M. Eidlitz, chairman.

T. W. Robinson, vice president of the Illinois Steel Co.

Charles G. DuBois, auditor of the New York Telephone Co.

Mrs. Gertrude Beeks Easley, secretary to the Committee on Labor of the Advisory Commission of the Council of National Defense.

William J. Spencer, secretary of the Building Trades department, American Federation of Labor.

SECTION ON INDUSTRIAL SERVICE.

(Dissolved January, 1918.)

L. C. Marshall, chief.

W. B. Hale.

J. M. Gaines.

COMMITTEES ON TRANSPORTATION AND COMMUNICATION OF THE ADVISORY COMMISSION.

COOPERATIVE COMMITTEE ON TELEGRAPHS AND TELEPHONES.

(Inactive after January, 1918.)

Theodore N. Vail, president American Telephone & Telegraph Co., chairman.

N. C. Kingsbury, vice president American Telephone & Telegraph Co.

Newcomb Carlton, president Western Union Telegraph Co.

Charles P. Bruch, vice president Postal Telegraph Co.

F. B. McKinnon, vice president United States Independent Telephone Association.

COOPERATIVE COMMITTEE ON RAILROAD TRANSPORTATION.

Special Committee on National Defense of the American Railway Association.

(Dissolved Dec. 28, 1917.)

EXECUTIVE COMMITTEE.

Fafrax Harrison, president Southern Railway, chairman.
Samuel Rea, president Pennsylvania Railroad.
Julius Kruttschitt, chairman executive committee Southern Pacific Co.
Hale Holden, president Chicago, Burlington & Quincy Railroad.
Howard Elliott, chairman of the board, New York, New Haven & Hartford Railroad.
Daniel Willard, president Baltimore & Ohio Railroad, member ex officio.
Edgar E. Clark, Interstate Commerce Commission, member ex officio.
George Hodges, assistant to general chairman.
J. E. Fairbanks, secretary.

NORTHEASTERN DEPARTMENT.

J. H. Hustis, receiver Boston & Maine Railroad, chairman.
H. M. Biscoe, vice president Boston & Albany Railroad.
Howard Elliott, chairman of the board, New York, New Haven & Hartford Railroad.
Morris McDonald, president Maine Central Railroad.
E. J. Pearson, president New York, New Haven & Hartford Railroad.

EASTERN DEPARTMENT.

L. F. Loree, president Delaware & Hudson Co., chairman.
W. G. Besler, president and general manager Central Railroad of New Jersey.
Samuel Rea, president Pennsylvania Railroad.
A. H. Smith, president New York Central lines.
A. W. Thompson, vice president Baltimore & Ohio Railroad.
W. W. Atterbury, vice president Pennsylvania Railroad.

SOUTHEASTERN DEPARTMENT.

W. J. Harahan, president Seaboard Air Line Railway, chairman.
J. R. Kenley, president Atlantic Coast Line Railroad.
R. V. Taylor, vice president and general manager Mobile & Ohio Railway.
W. A. Winburn, president Central of Georgia Railway.
E. H. Coapman, vice president Southern Railway System.

CENTRAL DEPARTMENT.

R. H. Aishton, president Chicago & North Western Railway, chairman.
E. E. Calvin, president Union Pacific Railroad.
Hale Holden, president Chicago, Burlington & Quincy Railroad.
C. H. Markham, president Illinois Central Railroad.
G. L. Peck, fourth vice president Pennsylvania lines west of Pittsburgh.
G. T. Slade, first vice president Northern Pacific Railway.
E. D. Sewell, vice president Chicago, Milwaukee & St. Paul Railway.

SOUTHERN DEPARTMENT.

W. B. Scott, president Southern Pacific Co., Texas-Louisiana lines, chairman.
B. F. Bush, receiver Missouri Pacific Railway.
Julius Kruttschnitt, chairman executive committee Southern Pacific Co.
C. E. Schaff, receiver Missouri, Kansas & Texas Railway.
T. M. Schumacher, president El Paso & Southwestern Railroad.

WESTERN DEPARTMENT.

William Sproule, president Southern Pacific Co., Pacific system, chairman.
 J. D. Farrell, president Oregon-Washington Railroad & Navigation Co.
 R. S. Lovett, chairman executive committee Union Pacific System.
 E. P. Ripley, president Atchison, Topeka & Santa Fe Railway.

SUBCOMMITTEE ON EXPRESS.

D. S. Elliott, vice president American Express Co., chairman.
 E. A. Stedman, vice president and general manager Wells Fargo Co.
 J. B. Hockaday, vice president and general manager Southern Express Co.
 H. E. Huff, vice president Adams Express Co.

SUBCOMMITTEE ON CAR SERVICE.

C. M. Sheaffer, general superintendent of transportation Pennsylvania Railroad Co., chairman.
 W. L. Barnes, superintendent of transportation Chicago, Burlington & Quincy Railroad Co.
 W. C. Kendall, superintendent of transportation Boston & Maine Railroad Co.
 G. F. Richardson, superintendent of transportation Southern Pacific Co.
 J. A. Somerville, general superintendent of transportation Missouri Pacific Railway.
 D. E. Spangler, superintendent of transportation Norfolk & Western Railway Co.
 M. Nicholson, assistant to vice president Great Northern Railway Co.

SUBCOMMITTEE ON MILITARY EQUIPMENT STANDARDS.

J. T. Wallis, general superintendent of motive power Pennsylvania Railroad Co., chairman.
 C. E. Chambers, superintendent of motive power Central Railroad of New Jersey.
 C. A. Lindstrom, assistant to president Pressed Steel Car Co.
 F. W. Mahl, director of purchases Southern Pacific Co.
 Peter Parke, chief engineer Pullman Co.
 R. E. Smith, general superintendent of motive power, Atlantic Coast Line.
 C. B. Young, mechanical engineer Chicago, Burlington & Quincy Railroad Co.

SUBCOMMITTEE ON MILITARY TRANSPORTATION ACCOUNTING.

A. H. Plant, comptroller Southern Railway Co., chairman.
 M. P. Blauvelt, comptroller Illinois Central Railroad Co., Chicago, Ill.
 G. R. Martin, vice president Great Northern Railway Co., St. Paul, Minn.
 A. D. McDonald, vice president Southern Pacific Co.
 C. B. Seger, vice president and comptroller Union Pacific System, Omaha, Nebr.
 C. I. Sturgis, general auditor Chicago, Burlington & Quincy Railroad Co.
 R. A. White, general auditor New York Central Lines, New York.

SUBCOMMITTEE ON MILITARY PASSENGER TARIFFS.

E. L. Bevington, chairman Transcontinental Passenger Association, Chicago, chairman.
 F. C. Donald, commissioner Central Passenger Association, Chicago.
 W. H. Howard, secretary Southeastern Passenger Association, Atlanta.
 C. L. Hunter, vice chairman Trunk Line Association, New York.
 W. L. Pratt, chairman New England Passenger Association, Boston, Mass.

SUBCOMMITTEES ON MILITARY FREIGHT TARIFFS.

L. Green, vice president Southern Railway Co., Washington, D. C.
 E. B. Boyd, chairman Western Trunk Line Association, Chicago, Ill.
 L. E. Chalenor, chairman Southeastern Freight Association, Atlanta, Ga.
 R. H. Countis, chairman Transcontinental Freight Bureau, Chicago.
 F. A. Leland, chairman Southwestern Tariff Commission, St. Louis.
 C. C. McCain, chairman Trunk Line Association, New York.
 E. Morris, chairman Central Freight Association, Chicago.

SUBCOMMITTEE ON MATERIALS AND SUPPLIES.

H. B. Spencer, vice president Southern Railway System, Washington, D. C., chairman.
 W. E. Hodges, vice president Atchison, Topeka & Santa Fe Railway Co.
 F. W. Mahl, director of purchases and mechanical engineer Southern Pacific Co.
 W. H. Myers, vice president Pennsylvania Railroad Co.
 J. W. Taylor, assistant to president Chicago, Milwaukee & St. Paul Railway Co.
 George G. Yeomans, purchasing agent New York, New Haven & Hartford Railroad Co.

COOPERATIVE COMMITTEE ON ELECTRIC RAILROAD TRANSPORTATION.

COMMITTEE ON NATIONAL DEFENSE OF AMERICAN ELECTRIC RAILWAY ASSOCIATION.

(Dissolved February, 1918.)

Gen. George H. Harries, president of the Omaha Electric Light & Power Co., Omaha, Nebr., chairman.
 Frank R. Ford, vice chairman Ford, Bacon & Davis, 115 Broadway, New York, in charge of general matters.
 L. S. Storrs, president the Connecticut Co., New Haven, Conn., assigned to the Northeastern Military Department.
 B. I. Budd, president Metropolitan West Side Elevated Railway Co., Chicago, Ill., assigned to the Central Military Department.
 C. Loomis Allen, president Allen & Peck (Inc.), Syracuse, N. Y., assigned to the Eastern Military Department.
 P. H. Gadsden, president Charleston Consolidated Railway & Lighting Department, Charleston, S. C., assigned to the Southeastern Military Department.
 L. C. Bradley, district manager Stone & Webster, Houston, Tex., assigned to the Southern Military Department.
 W. R. Alberger, vice president and general manager San Francisco-Oakland Terminal Railways, San Francisco, Cal., assigned to the Western Military Department.

COMMITTEE ON INLAND WATER TRANSPORTATION.

(Dissolved February, 1918.)

Gen. W. M. Black, Chief of Engineers, United States Army, chairman.
 Walter S. Dickey, manufacturer of clay products, president Kansas City-Missouri River Navigation Co., Kansas City, Mo., vice chairman.
 George E. Bartol,¹ president Philadelphia Bourse.
 Capt. J. F. Ellison, former secretary National River and Harbors Congress, Cincinnati, Ohio.
 Joy Morton, director in many financial, mercantile, and transportation companies, Chicago, Ill.

¹ Deceased.

James E. Smith, president Mississippi Valley Waterways Association, St. Louis, Mo.

M. J. Sanders, president New Orleans Board of Trade, representative Harrison-Leyland lines.

R. A. C. Smith, commissioner of docks, New York City.

Daniel Willard, chairman advisory commission, member ex officio.

Lieut. Col. C. Keller, Corps of Engineers, United States Army, secretary.

COMMITTEE ON SUPPLIES.

(Later the Supplies Section of the Finished Products Division of the War Industries Board.)

(Functions assumed by Quartermaster Department in January, 1918.)

Julius Rosenwald, chairman.
Charles Eisenman, vice chairman.
Albert L. Scott.
Harry L. Baily.
Miller Wilson.
D. D. Martin.
Arthur Lawrence.
J. F. McElwain.
Lincoln Cromwell.
F. E. Haight.

Rufus W. Scott.
F. R. Eddington.
C. B. Stevens.
S. M. Kaplan.
S. F. Strook.
Jacob F. Brown.
Stephen O. Metcalf.
Frederic S. Clark.
Maj. H. S. Wonson.
Capt. B. B. Burgunder.

SUBCOMMITTEE ON ARMY AND NAVY ARTILLERY.

(Dissolved September, 1917.)

S. M. Vauclain, vice president Baldwin Locomotive Works, chairman.

Rear Admiral N. E. Mason, United States Navy.

Lieut. Commander N. W. Pickering.

Maj. C. C. Jamieson.

W. H. Vandervoort, of Root & Vandervoort Engineering Co.

J. B. King, Midvale Steel & Ordnance Co.

W. J. Hagman, Niles-Bement-Pond Co.

S. P. Bush, Buckeye Steel Castings Co.

Benedict Crowell, Crowell, Lundorff, Little Co., Cleveland, Ohio, secretary.

COMMITTEES AT FIRST COOPERATING WITH THE ADVISORY COMMISSION, LATER WITH WAR INDUSTRIES BOARD.

(Dissolved September, 1917.)

COOPERATIVE COMMITTEE ON LOCOMOTIVES.

S. M. Vauclain, vice president Baldwin Locomotive Works, chairman.

Andrew Fletcher, president American Locomotive Co.

J. S. Coffin, chairman Lima Locomotive Corporation.

H. P. Ayres, vice president H. K. Porter Locomotive Co.

COOPERATIVE COMMITTEE ON CARS.

S. M. Vauclain, vice president Baldwin Locomotive Works, chairman.

E. F. Carry, president Haskell & Barker Co.

C. S. Gawthrop, vice president American Car & Foundry Co.

Clive Runnells, vice president Pullman Co.

J. M. Hansen, president Standard Steel Car Co.

N. S. Reeder, vice president Pressed Steel Car Co.

COUNCIL OF NATIONAL DEFENSE.

*Financial statement, fiscal years 1917 and 1918.***Resources:****Appropriations—**

Council of National Defense, 1917-----	\$200,000.00
Council of National Defense, 1917-18 (act of June 15, 1917)----	500,000.00
Council of National Defense, 1917-18 (act of Mar. 28, 1918)----	250,000.00
National Security and Defense, Council of National Defense (building)-----	225,000.00
National Security and Defense, Council of National Defense (War Industries Board)-----	200,000.00
Reimbursements and recoveries-----	19,304.33
Total-----	1,394,304.33

	Dec. 11, 1916, to June 30, 1917.	July 1, 1917, to June 30, 1918.	Total.
Expenditures:			
Salaries—			
Administrative Division—			
Office of the director....	\$7,269.40	\$19,677.83	\$26,947.23
Office of the secretary...	6,762.28	14,782.38	21,544.66
Office of the chief clerk..	3,019.91	15,860.53	18,880.44
Other administrative....	3,792.68	54,322.52	58,115.20
Total.....	\$20,844.27	\$104,643.26	\$125,487.53
War Industries Board—			
War Industries Board....	5,266.26	61,366.33	66,632.59
Priorities Committee....		76,132.46	76,132.46
Committee on Supplies....	1,618.90	11,987.06	13,605.96
Committee on Raw Ma- terials.....		41,525.60	41,525.60
Total.....	6,885.16	191,011.45	197,896.61
Medical Division.....	10,243.08	42,238.17	52,481.25
State Councils Section.....	724.46	39,928.91	40,653.37
Commercial Economy Board.....	1,577.51	24,420.85	25,998.33
Division of Statistics.....	954.17	42,248.21	43,202.46
Aircraft Production Board.....	894.69	6,347.73	7,242.24
Woman's Committee.....	654.75	25,809.99	26,464.48
Labor Division.....	960.83	12,665.91	13,626.77
Highway Transports Com- mittee.....		5,943.66	5,943.66
Committee on Coal Produc- tion.....	250.00	1,222.51	1,472.51
Division of Engineering and Education.....	200.00	1,941.58	2,141.58
Committee on Agriculture.....		933.33	933.33
Committee on Industrial Service.....		1,180.55	1,180.55
Industrial Inventory.....		4,474.71	4,474.71
National Research Council.....		1,535.84	1,535.85
Total salaries.....	44,188.92	506,546.66	550,735.84
Council building, Eighteenth and D Streets, NW.....		224,775.43	224,775.43
Furniture and equipment.....	41,155.00	118,063.64	159,218.64
Printing and stationery, etc.....	16,679.34	56,547.53	73,226.87
Telegraph and telephone service.....	6,828.33	50,462.02	57,290.35
Rent of offices and grounds.....	12,800.08	36,812.10	49,612.18
Subsistence and travel.....	2,976.96	15,143.75	18,120.71
Miscellaneous expenses.....	2,498.28	28,832.92	31,331.20
Total expenditures.....	127,126.91	1,037,184.05	1,164,310.96

Total resources..... \$1,394,304.33
Total expenditures..... 1,164,310.96

Unexpended balance Aug. 1, 1918..... 229,993.37

Statement of travel performed by the officers and employees of the Council of National Defense from July 1, 1917, to June 30, 1918.

Date.	Name.	Title.	Destination.	Purpose of travel.	Expense.
Nov. 8 to Nov. 14, 1917.....	John W. Ames.....	Expert.....	Washington, D. C.....	Conference of agricultural committee.....	\$44.55
Sept. 17 to Sept. 21, 1917.....	H. P. Armsby.....	do.....	New York, N. Y.; New Haven, Conn.; and Washington, D. C.....	Consultation in reference to work of agriculture committee.....	48.33
July 1 to July 10, 1917.....	A. D. Ballou.....	Chief of section.....	Chicago, Ill.....	Conference on work of medical section.....	54.40
Jan. 5 to Jan. 19, 1918.....	Raymond Beck.....	Expert.....	Points in the States of New York, New Jersey, Pennsylvania, Maryland, and Ohio.....	Inspecting motor transport routes.....	152.34
Jan. 22 to Jan. 24, 1918.....	do.....	do.....	Washington, D. C.....	Conference of highway transport committee.....	25.80
Feb. 1 to Feb. 26, 1918.....	do.....	do.....	Points in the States of Illinois, Indiana, Maryland, Michigan, Missouri, Ohio, Pennsylvania, and West Virginia.....	Inspecting motor transport routes.....	311.87
Mar. 6 to Mar. 14, 1918.....	do.....	do.....	Akron, Columbus, Zanesville, and Cambridge, Ohio.....	do.....	34.85
Mar. 15 to Mar. 17, 1918.....	do.....	do.....	New York, N. Y.....	do.....	13.30
Mar. 18 to Mar. 22, 1918.....	do.....	do.....	Baltimore and Annapolis, Md.....	do.....	9.75
Mar. 23 to Mar. 27, 1918.....	do.....	do.....	Cape Charles and Old Point Comfort, Va.....	do.....	8.35
Apr. 3 to Apr. 10, 1918.....	do.....	do.....	Akron, Cleveland, and Columbus, Ohio.....	do.....	33.50
May 1 to May 5, 1918.....	do.....	do.....	Akron, Cleveland, Toledo, and Lima, Ohio.....	do.....	37.30
Nov. 21 to Nov. 27, 1917.....	J. Bernstein.....	do.....	Baltimore, Md.....	do.....	41.40
Apr. 22 to Apr. 24, 1918.....	P. E. Brown.....	do.....	New York and Philadelphia, Pa.....	do.....	23.75
Nov. 7 to Nov. 12, 1917.....	Earle B. Butchers.....	do.....	Washington, D. C.....	Conference of agriculture committee.....	77.65
Jan. 7 to Jan. 19, 1918.....	do.....	do.....	Points in the States of New York, New Jersey, Pennsylvania, and Maryland.....	Inspecting motor transport routes.....	67.23
Feb. 1 to Feb. 26, 1918.....	do.....	do.....	Points in the States of Pennsylvania, Ohio, Michigan, Indiana, Illinois, West Virginia, and Maryland.....	do.....	107.83
Mar. 23 to Mar. 27, 1918.....	do.....	do.....	Points in the States of Maryland and Virginia.....	do.....	23.95
May 13 to Aug. 25, 1917.....	T. W. Carlisle.....	do.....	Points in the States of New York, Connecticut, and Pennsylvania.....	Inspecting work in rifle factories.....	329.99
Sept. 11 to Sept. 15, 1917.....	Geo. E. Chatillon.....	do.....	Boston, Mass.....	Inspection of optical glass and instrument plants.....	38.55
Jan. 8 to Jan. 9, 1918.....	do.....	do.....	New York, N. Y.....	do.....	20.05
Apr. 1 to Apr. 10, 1918.....	do.....	do.....	Pittsburgh, Pa.; Dayton and Cleveland, Ohio; Buffalo, Rochester, and New York, N. Y.....	do.....	85.94
Apr. 17 to Apr. 22, 1918.....	do.....	Section chief.....	New York, N. Y.....	do.....	25.00
June 7 to June 8, 1918.....	Douglas W. Clinch.....	do.....	Philadelphia, Pa.....	Meeting in reference to Volunteer Medical Service Corps.....	11.90
Mar. 8 to Mar. 13, 1918.....	Alexis J. Colman.....	do.....	Chattanooga, Tenn., and Fort Oglethorpe, Ga.....	Meeting of general medical board.....	56.05
Apr. 26 to Apr. 27, 1918.....	do.....	do.....	Philadelphia, Pa.....	Meeting of State committee.....	12.80

Date	Name	Section	Location	Amount
June 17 to June 24, 1918.	Alexis J. Colman	Section chief	Boston, Mass.; Detroit, Mich.; Cleveland, Ohio.	\$117.01
July 12 to July 17, 1917.	Melvin T. Copeland	Merchandizing expert	Detroit, Mich.	57.45
Sept. 26 to Sept. 27, 1917.	do.	do.	New York, N. Y.	17.65
July 19 to July 22, 1917.	Everett L. Crawford	Expert	do.	13.80
Sept. 7 to Sept. 9, 1917.	do.	do.	do.	18.65
Jan. 5, 1918.	Michael D. Crowley	Clerk	Baltimore, Md.	2.40
May 3 to May 4, 1918.	do.	do.	do.	2.75
May 9 to May 10, 1918.	do.	do.	Philadelphia, Pa.	18.02
May 6 to May 8, 1918.	do.	do.	Newark, N. J.	30.19
Oct. 9 to Oct. 11, 1917.	John Cutler	Merchandizing expert	New York, N. Y.	20.60
Nov. 26 to Dec. 3, 1917.	do.	do.	New York, N. Y.; Boston and Lawrence, Mass.	50.50
Dec. 8 to Dec. 11, 1917.	do.	do.	New York, N. Y.	25.85
Jan. 2 to Jan. 3, 1918.	do.	do.	do.	18.30
Mar. 4 to Mar. 11, 1918.	do.	do.	New York, N. Y., and Philadelphia, Pa.	49.35
Jan. 8 to Jan. 10, 1918.	do.	do.	Boston, Mass., and Chicago, Ill.	53.20
May 8 to May 10, 1918.	do.	do.	New York, N. Y.	26.95
May 27 to May 28, 1918.	do.	do.	do.	27.45
Apr. 20 to Apr. 22, 1918.	George E. De Nike	Expert	do.	13.40
May 11 to May 13, 1918.	do.	do.	do.	12.80
Sept. 15 to Oct. 6, 1917.	Stanley A. Dennis	Clerk	Baltimore, Md.; Philadelphia, Pa.; New York, N. Y.; Providence, R. I.; Boston, Mass., and New Haven, Conn.	132.90
Nov. 20 to Nov. 23, 1917.	Robert L. Dickinson	Expert	New York, N. Y.	14.30
Oct. 18 to Oct. 25, 1917.	do.	do.	Chicago, Ill.	66.45
Sept. 4 to Sept. 5, 1917.	do.	do.	Boston, Mass.	1.05
May 5 to May 10, 1918.	do.	do.	New York, N. Y.	16.34
June 2 to June 8, 1918.	do.	do.	New York, N. Y.; Boston, Mass.; Portland, Me.; and Providence, R. I.	45.57
Dec. 18 to Dec. 19, 1917.	Malcolm C. Dizer	Clerk	Philadelphia, Pa.	18.00
Jan. 22 to Jan. 23, 1918.	do.	do.	New York, N. Y., and Newark, N. J.	39.60
July 1 to July 9, 1917.	M. Florence Donnelly	Assistant section chief	Chicago, Ill.	45.00
Nov. 9 to Nov. 12, 1917.	W. B. Elliott	Expert	Washington, D. C.	27.64
June 16 to June 29, 1917.	J. F. Ellison	do.	St. Louis, Mo.; Rock Island and Chicago, Ill.; Minneapolis and St. Paul, Minn.; and Washington, D. C.	138.87
June 5 to June 14, 1917.	do.	do.	Washington, D. C., and Pittsburgh, Pa.	68.00
July 10 to July 13, 1917.	do.	do.	Washington, D. C.	70.15
Oct. 15 to Oct. 19, 1917.	do.	do.	do.	46.60
Oct. 14 to Oct. 18, 1917.	Emmons K. Ellsworth	Chief clerk	New York, N. Y.	23.15
Jan. 7 to Jan. 9, 1918.	Charles K. Foster	Expert	Boston, Mass.	23.90
Sept. 9 to Sept. 22, 1918.	John M. Gaines	do.	Washington, D. C.; Baltimore, Md.; and Hartford, Conn.	165.28
Sept. 13 to Sept. 20, 1917.	Inez J. Gardner	Clerk	New York, N. Y.	27.30
			Investigations for medical section.	
			Investigation of bread situation.	
			Conference in reference to commercial economy board.	
			Investigations for commercial economy board.	
			Conference in connection with finished products section.	
			Purchase of equipment.	
			do.	
			do.	
			General wool meeting.	
			Garment trade meeting.	
			Clothing trade meeting.	
			Meeting of clothing manufacturers.	
			Clothing trade meeting.	
			do.	
			do.	
			Conference on platinum.	
			do.	
			Investigations for commercial economy board.	
			Meeting of New York committee.	
			Meeting of general medical board.	
			Meeting of Massachusetts State committee.	
			Meeting of New York committee.	
			Investigations for medical section.	
			Investigation relative to paint situation.	
			do.	
			Assisting Dr. Franklin Martin.	
			Conference of agriculture committee.	
			Conferences on inland water transportation.	
			do.	
			do.	
			Purchase of equipment.	
			Investigation of power situation in New England.	
			Conferences on State councils work.	
			Meeting of welfare committee on labor.	

Statement of travel performed by the officers and employees of the Council of National Defense from July 1, 1917, to June 30, 1918—Continued.

Date.	Name.	Title.	Destination.	Purpose of travel.	Expense.
Apr. 16 to Apr. 19, 1917	Edwin F. Gay	Expert.	Washington, D. C.	Consultation with commercial economy board.	37.80
Sept. 4 to Sept. 7, 1917	do.	do.	do.	do.	39.00
Oct. 5 to Oct. 15, 1917	do.	do.	do.	do.	66.90
Oct. 28 to Nov. 3, 1917	do.	do.	do.	do.	39.10
Nov. 26 to Dec. 16, 1917	do.	do.	do.	do.	91.70
Sept. 19 to Sept. 20, 1917	Walter S. Gifford	Director	Atlantic City, N. J.	To address business men's association.	14.70
Sept. 19 to Sept. 24, 1917	William B. Hale	Expert.	Chicago, Ill., and Milwaukee, Wis.	To attend State council meetings.	55.75
Apr. 29 to May 3, 1918	J. Linden Heacock	Clerk.	Louisville, Ky.	Investigation relative to agriculture implement industry.	59.38
Oct. 13 to Nov. 16, 1917	Curtice N. Hitchcock	Assistant secretary.	Points in the States of Pennsylvania, Indiana, Missouri, Illinois, Michigan, Ohio, New York, Massachusetts, and Connecticut.	Visiting State councils offices.	341.06
Nov. 9 to Nov. 11, 1917	E. H. Jenkins	Expert.	Washington, D. C.	Conference of agriculture committee.	26.24
Nov. 9 to Nov. 11, 1917	T. E. Kett	do.	do.	do.	30.80
Mar. 28 to Mar. 30, 1918	H. Maxwell Lakeman	Clerk.	do.	Consultation on industrial inventory.	18.85
Nov. 7 to Nov. 18, 1917	A. H. Leidigh	Expert.	do.	Conference of agriculture committee.	117.37
Dec. 13 to Dec. 14, 1917	Richard Lennihan	Clerk.	Richmond, Va.	Investigation relative to economy of leather in the manufacture of shoes.	19.60
Apr. 13 to Apr. 21, 1918	do.	do.	Boston, Mass., and New York, N. Y.	Investigation relative to shoe cartons and conservation.	80.89
Nov. 24 to Nov. 26, 1917	John D. McLean	Expert.	Philadelphia, Pa.	Meeting of Pennsylvania State committee.	9.55
Jan. 8 to Jan. 9, 1918	do.	do.	Philadelphia and Harrisburg, Pa.	Meeting of county committees.	18.85
Mar. 8 to Mar. 12, 1918	do.	do.	Chattanooga, Tenn.	Meeting of general medical board.	51.75
Apr. 15 to Apr. 20, 1918	do.	do.	Augusta and Savannah, Ga., and Aiken, S. C.	Investigations for medical section.	62.91
May 6 to May 17, 1918	do.	do.	Points in the States of Arkansas, Mississippi and Tennessee.	do.	115.65
May 24 to May 25, 1918	do.	do.	Philadelphia, Pa.	do.	6.08
June 5 to June 16, 1918	do.	do.	Cincinnati, Ohio; St. Louis, Mo.; and Chicago, Ill.	do.	112.32
July 1 to July 9, 1917	Franklin Martin	Member of advisory commission.	Chicago, Ill.	Conference on medical work.	45.00
July 19 to July 22, 1917	do.	do.	do.	do.	45.00
July 31 to Aug. 3, 1917	do.	do.	do.	do.	45.00
Aug. 11 to Aug. 16, 1917	do.	do.	New York, N. Y., and Chicago, Ill.	do.	59.25
Aug. 31 to Sept. 5, 1917	do.	do.	Chicago, Ill.	do.	45.00
Sept. 9 to Sept. 12, 1917	do.	do.	do.	do.	45.00
Sept. 19 to Sept. 24, 1917	do.	do.	do.	do.	45.00
Sept. 24 to Oct. 8, 1917	do.	do.	do.	do.	45.00
Oct. 2 to Oct. 3, 1917	do.	do.	do.	do.	45.00
Oct. 13 to Nov. 3, 1917	do.	do.	do.	do.	45.00
Feb. 7 to Feb. 18, 1918	do.	do.	Jersey City, N. J.; Battle Creek, Mich.; and Chicago, Ill.	do.	66.99

Feb. 23, 1918.	Franklin Martin.	Member of advisory commission.	Philadelphia, Pa.	Conference on medical work.	4.15
Mar. 8 to Mar. 12, 1918.	do.	do.	Chicago, Ill.; Chattanooga, Tenn.	do.	58.58
Apr. 10 to Apr. 16, 1918.	do.	do.	Chicago, Ill.	do.	45.00
Apr. 26 to Apr. 27, 1918.	do.	do.	Philadelphia, Pa.	do.	6.80
May 6 to May 21, 1918.	do.	do.	Points in the States of Missouri, Texas, Oklahoma, Illinois, and Indiana.	do.	153.07
June 4 to June 27, 1918.	do.	do.	Cincinnati, Ohio; Chicago, Ill.; Boston, Mass.; Detroit, Mich.; Pittsburgh, Pa. and Philadelphia, Pa.	do.	227.76
Nov. 21 to Nov. 28, 1917.	Sidney S. Merithew.	Expert.	Washington, D. C.	Conference of highways transport committee.	59.00
Dec. 28 to Dec. 29, 1917.	Herbert R. Moody.	do.	do.	Conference of committee on chemicals.	20.95
Jan. 10 to Jan. 21, 1918.	do.	do.	do.	do.	15.80
Jan. 26 to Feb. 2, 1918.	do.	do.	do.	do.	22.95
Feb. 5 to Feb. 10, 1918.	do.	do.	do.	do.	15.80
Feb. 12 to Feb. 17, 1918.	do.	do.	do.	do.	15.80
Feb. 19 to Feb. 24, 1918.	do.	do.	do.	do.	15.80
Feb. 26 to Mar. 3, 1918.	do.	do.	do.	do.	15.80
Mar. 5 to Mar. 10, 1918.	do.	do.	do.	do.	15.80
Mar. 12 to Mar. 17, 1918.	do.	do.	do.	do.	15.80
Mar. 19 to Mar. 24, 1918.	do.	do.	do.	do.	15.80
Mar. 26 to Mar. 30, 1918.	do.	do.	do.	do.	15.80
Apr. 14 to Apr. 16, 1918.	do.	do.	do.	do.	15.80
Apr. 22 to Apr. 23, 1918.	do.	do.	do.	do.	15.80
Apr. 29 to Apr. 30, 1918.	do.	do.	do.	do.	15.80
May 4 to May 6, 1918.	do.	do.	do.	do.	15.80
May 12 to May 14, 1918.	do.	do.	New York, N. Y.	Consultation as to chemicals.	15.80
May 19 to May 21, 1918.	do.	do.	Washington, D. C.	do.	15.80
May 27 to May 28, 1918.	do.	do.	New York, N. Y.	Conference of committee on chemicals.	15.80
Nov. 8 to Nov. 17, 1917.	C. A. Mooers.	do.	Washington, D. C.	Consultation as to chemicals.	15.80
May 11 to May 13, 1918.	Lewis Fenwell.	Section chief.	New York, N. Y.	do.	37.07
May 13 to May 19, 1918.	do.	do.	do.	Establishing wool section in New York, N. Y.	18.45
Oct. 7 to Dec. 11, 1917.	Harry B. Prather.	Expert.	Erie, Pa., and Holyoke, Mass.	Investigations for priority committee.	28.10
Oct. 29 to Oct. 29, 1917.	H. T. Price.	Section chief.	Philadelphia, Pa.	Conference on medical work.	48.51
Nov. 20 to Nov. 21, 1917.	James A. Savage.	Expert.	Salina, Kans.	Remount investigations.	8.10
June 20 to June 24, 1917.	James A. B. Schlerer.	do.	Washington, D. C.	Conference of State council section.	3.55
July 11 to Aug. 8, 1917.	do.	do.	Points in the States of Louisiana, Tennessee, Kentucky, West Virginia, and North Carolina.	Investigating State councils of defense.	104.80
Aug. 2 to Oct. 17, 1917.	do.	do.	Points in the States of New York, Missouri, Maryland, Delaware, Kansas, Iowa, Illinois, Idaho, Utah, Colorado, Washington, and California.	do.	323.33
May 3 to June 1, 1918.	do.	do.	Points in the States of Colorado, New Mexico, California, Nevada, Utah, Idaho, Oregon, Washington, and Montana.	do.	415.87
June 8 to June 8, 1918.	do.	do.	Newark, N. J.	do.	318.15
Nov. 9 to Nov. 11, 1917.	O. M. Shedd.	do.	Washington, D. C.	Conference of agriculture committee.	7.04
July 9 to July 10, 1917.	Frank F. Simpson.	Section chief.	Cincinnati, Ohio.	Conference on medical work.	43.58
Aug. 11 to Aug. 13, 1917.	do.	do.	New York, N. Y.	do.	24.00

Statement of travel performed by the officers and employees of the Council of National Defense from July 1, 1917, to June 30, 1918—Continued.

Date.	Name.	Title.	Destination.	Purpose of travel.	Expense.
Aug. 27 to Aug. 30, 1917....	Frank P. Simpson.....	Section chief.....	Chicago, Ill.....	Conference on medical work.....	\$71.72
Sept. 12 to Sept. 13, 1917....	do.....	do.....	Pittsburgh, Pa.....	Pittsburgh office.....	30.40
Sept. 25 to Sept. 26, 1917....	do.....	do.....	do.....	do.....	19.50
Sept. 29 to Oct. 2, 1917.....	do.....	do.....	New York, N. Y., Pittsburgh, Pa.; Chicago, Ill.....	Conference on medical work.....	59.55
Oct. 18 to Oct. 27, 1917.....	do.....	do.....	Pittsburgh, Pa.; Chicago, Ill.....	Pittsburgh office and conference on medical work.....	46.70
Oct. 29 to Nov. 3, 1917.....	do.....	do.....	Chicago, Ill.....	do.....	45.00
Nov. 13 to Nov. 16, 1917.....	do.....	do.....	Memphis, Tenn.....	Conference on medical work.....	49.03
Feb. 12 to Mar. 3, 1918.....	do.....	do.....	Points in the States of Illinois, Iowa, Nebraska, Missouri, Kansas, Oklahoma, Texas, Tennessee, South Carolina, and Virginia.....	Investigating county committees of medical section.....	314.36
Mar. 5 to Mar. 6, 1918.....	do.....	do.....	Pittsburgh, Pa.....	Pittsburgh office.....	20.00
Apr. 27 to Apr. 28, 1918.....	do.....	do.....	Baltimore, Md.....	do.....	20.00
Apr. 11, 1918.....	do.....	do.....	New York, N. Y.....	Investigating State council of defense.....	1.90
Apr. 26 to Apr. 27, 1918.....	Elliott D. Smith.....	do.....	do.....	do.....	17.30
May 4 to May 5, 1918.....	do.....	do.....	do.....	do.....	18.25
May 29 to May 31, 1918.....	do.....	do.....	New York, N. Y., and Baltimore, Md.....	Conferring with State council officials.....	18.30
June 29 to June 30, 1918.....	do.....	do.....	Pittsburgh and Philadelphia, Pa.....	do.....	4.08
June 20 to June 27, 1918.....	do.....	do.....	New York, N. Y.....	do.....	19.04
May 4 to May 16, 1918.....	Rutledge Smith.....	Expert.....	Points in the States of New York, Maine, Massachusetts, Vermont, Connecticut, and District of Columbia.....	do.....	153.99
June 5 to June 9, 1918.....	do.....	do.....	Atlanta, Ga., Charlotte, Ala., Spartanburg, S. C., and Knoxville, Tenn.....	do.....	46.27
June 11 to June 15, 1918.....	do.....	do.....	Tallahassee, Fla., Atlanta, Ga., Jacksonville, Fla., Pensacola, Fla., and Montgomery, Ala.....	do.....	75.96
Aug. 12 to Aug. 31, 1917.....	Vernon A. Smith.....	Clerk.....	Points in the States of Ohio, Michigan, and Indiana.....	Investigations for commercial economy board.....	80.68
Aug. 31 to Sept. 30, 1917.....	do.....	do.....	Points in the States of Illinois, Michigan, and Indiana.....	do.....	126.44
Oct. 1 to Oct. 11, 1917.....	do.....	do.....	Points in the States of Illinois, Michigan, and Ohio.....	do.....	52.28
Nov. 8 to Nov. 24, 1917.....	James W. Sullivan.....	Chief of section.....	Buffalo, N. Y.....	Investigating labor conditions.....	100.88
July 5 to July 8, 1917.....	do.....	do.....	New York, N. Y.....	do.....	12.55
Dec. 14, 1917.....	do.....	do.....	Baltimore, Md.....	do.....	2.40
June 5 to June 24, 1918.....	do.....	do.....	St. Paul, Minn.....	do.....	151.76
July 20 to July 27, 1918.....	Henry H. Taylor.....	Merchandising expert.....	New York, N. Y.....	Investigations for commercial economy board.....	47.40
Sept. 11 to Sept. 13, 1917.....	do.....	do.....	do.....	do.....	30.26
Oct. 24 to Oct. 28, 1917.....	do.....	do.....	do.....	do.....	40.56
Sept. 3 to Sept. 5, 1917.....	H. K. Taylor.....	do.....	Cleveland, Ohio, and Philadelphia, Pa.....	Investigation relative to delivery.....	38.10
Oct. 22 to Oct. 23, 1917.....	do.....	do.....	Baltimore, Md.....	do.....	1.76

Oct. 20 to Nov. 3, 1917.	H. K. Taylor	Merchandising expert.	New York, Albany and Rochester, N. Y.	Investigation relative to delivery	32.05
Dec. 15 to Dec. 19, 1917.	do.	do.	Philadelphia, Pa., and New York, N. Y.	do.	25.57
Feb. 2 to Feb. 7, 1918.	do.	do.	Philadelphia, Pa., New York, N. Y., and Hartford, Conn.	do.	33.33
May 17, 1918.	do.	do.	Baltimore, Md.	do.	1.75
Apr. 19, 1918.	Frank E. Thompson.	Expert.	Newark, N. J.	Investigating mill conditions.	18.65
Apr. 1 to Apr. 31, 1918.	do.	do.	Washington, D. C.	Conference of committee on steel supply.	18.83
Apr. 9 to Apr. 11, 1918.	do.	do.	Philadelphia, Pa.	Investigating mill conditions.	31.40
Apr. 17 to Apr. 20, 1918.	do.	do.	Newark, N. J., Philadelphia and Pottstown, Pa.	do.	30.35
May 1 to May 2, 1918.	do.	do.	Philadelphia, Coatsville, and Pottstown, Pa.	do.	18.60
Sept. 3 to Sept. 7, 1917.	Richard B. Watrous.	do.	Sumter, S. C.	Conferring with State council of defense officials.	35.35
Nov. 8 to Nov. 16, 1917.	A. L. Whitting.	do.	Washington, D. C.	Conference of Agriculture Committee.	67.38
Mar. 11 to Apr. 17, 1918.	Frank E. Williamson.	do.	Washington, D. C., Philadelphia, Pa. and New York, N. Y.	Inspecting motor transport routes.	131.84
Apr. 17 to Apr. 22, 1918.	do.	do.	Newark, N. J., and Baltimore, Md.	do.	34.20
June 3 to June 5, 1918.	do.	do.	Buffalo, Albany, Utica, Syracuse, and Rochester, N. Y.	do.	26.96
July 24 to Aug. 12, 1917.	John H. Winterbotham.	do.	Washington, D. C.	Conference of highways transport committees.	114.05
Aug. 12 to Aug. 13, 1917.	do.	do.	Bath, Me.	Conferring with State council of defense officials.	8.50
Sept. 3 to Sept. 4, 1917.	do.	do.	Minneapolis, Minn.	do.	28.20
Sept. 11 to Sept. 12, 1917.	do.	do.	Indianapolis, Ind.	do.	28.40
Sept. 20 to Sept. 22, 1917.	do.	do.	Lansing, Mich.	do.	15.30
Sept. 26 to Sept. 28, 1917.	do.	do.	Madison, Wis.	do.	42.72
Oct. 27 to Oct. 29, 1917.	do.	do.	Des Moines, Iowa, and Omaha, Nebr.	do.	42.08
Oct. 31 to Nov. 1, 1917.	do.	do.	Columbus, Ohio.	do.	24.83
Apr. 29 to May 6, 1918.	do.	do.	Columbus, Ohio, Washington, D. C., and Richmond, Va.	do.	82.93
May 14 to May 16, 1918.	do.	do.	Lansing, Mich.	do.	19.49
May 21 to May 27, 1918.	do.	do.	Columbus, Ohio, Washington, D. C., and Richmond, Va.	do.	76.25
June 11 to June 13, 1918.	do.	do.	Escanaba, Mich.	do.	31.55
June 16 to June 17, 1918.	do.	do.	Indianapolis, Ind.	do.	20.18
Feb. 21 to Feb. 24, 1918.	Donald T. Wright.	do.	Cincinnati, Ohio.	Investigations for Inland Waterways Transportation Committee.	18.99
May 17 to May 19, 1918.	Raymond Beck.	Expert.	New York, N. Y.	Inspecting motor transport routes.	13.80
May 21 to May 26, 1918.	do.	do.	do.	do.	37.15
June 5 to June 25, 1918.	Louise Butler.	Clerk.	St. Paul, Minn.	Investigating labor conditions.	165.52
Dec. 27 to Dec. 31, 1917.	J. Millar Wilson.	Expert.	Louisville, Ky.	Investigating wool conditions.	57.05
May 24 to May 26, 1918.	Leonard W. Williams.	Section Chief.	Philadelphia, Pa., and New York, N. Y.	Investigating steel conditions.	16.20
Jan. 3 to Jan. 8, 1918.	William T. Rodenbach.	Expert.	Akron, Ohio.	Investigation for committee on supplies.	42.31
Sept. 21 to Sept. 24, 1917.	E. O. Hayl.	do.	Atlanta, Ga.	do.	49.61
June 7 to June 14, 1918.	Henry D. Jump.	do.	Chicago, Ill.	Meeting of General Medical Board.	103.93
June 15 to June 24, 1918.	Grosvenor B. Clarkson.	Secretary.	New York, N. Y.	In connection with United States Student Nurse Reserve.	72.09
June 26 to July 6, 1918.	Helen W. Atwater.	Member of Woman's Committee.	Chicago, Ill., and Saratoga Springs, N. Y.	Field work of Woman's Committee.	125.69

Statement of travel performed by the officers and employees of the Council of National Defense from July 1, 1917, to June 30, 1918—Continued.

Date.	Name.	Title.	Destination.	Purpose of travel.	Expenses.
Jan. 25 to Feb. 2, 1918.....	Mrs. Josiah E. Cowles.....	Member of Woman's Committee.	Washington, D. C.	Conference of Woman's Committee.	\$70.00
May 10 to June 4, 1918.....	do.	do.	do.	do.	111.87
Nov. 19 to Dec. 6, 1917.....	do.	do.	do.	do.	204.45
June 14 to June 16, 1918.....	Lucile Faves.....	do.	do.	do.	40.00
Mar. 3, 1918.....	Amy Walker Field.....	do.	do.	do.	7.90
Aug. 12 to Aug. 17, 1917.....	Clarinda P. Lamar.....	do.	do.	do.	66.90
Sept. 8 to Oct. 28, 1917.....	do.	do.	Louisville, Covington, and Winchester, Ky.	Field work of Woman's Committee.	76.90
Oct. 27 to Nov. 1, 1917.....	do.	do.	Mobile, Ala.	do.	47.18
Nov. 19 to Nov. 20, 1917.....	do.	do.	Washington, D. C.	Conference of Woman's Committee.	35.14
Nov. 21 to Dec. 6, 1917.....	do.	do.	Raleigh, N. C.	Field Work of Woman's Committee.	33.45
Oct. 4 to Oct. 6, 1917.....	do.	do.	Indianapolis, Ind.	do.	27.25
Dec. 13 to Dec. 31, 1917.....	do.	do.	Washington, D. C.	Conference of Woman's Committee.	78.14
Jan. 21 to Apr. 7, 1918.....	do.	do.	do.	do.	122.37
May 4 to June 2, 1918.....	do.	do.	do.	Conferences of Woman's Committee.	101.92
June 22 to Aug. 7, 1918.....	do.	do.	Fort Smith, Ark., and Dallas, Tex.	Field work of Woman's Committee.	112.11
Nov. 2 to Nov. 4, 1917.....	Mrs. Phillip Moore.....	do.	Washington, D. C.	Conference of Woman's Committee.	23.18
Nov. 23 to Dec. 17, 1917.....	do.	do.	Trenton, N. J.	Field Work of Woman's Committee.	226.84
Mar. 19 to Mar. 20, 1918.....	do.	do.	Washington, D. C.	Conference of Woman's Committee.	18.15
Sept. 17 to Sept. 23, 1917.....	do.	do.	Lincoln and Omaha, Nebr.	Field Work of Woman's Committee.	125.10
Jan. 16 to Jan. 19, 1918.....	do.	do.	Washington, D. C.	Conference of Woman's Committee.	37.41
Jan. 22 to Feb. 7, 1918.....	do.	do.	do.	do.	124.30
Feb. 15 to Mar. 2, 1918.....	do.	do.	do.	do.	85.45
Aug. 12 to Aug. 24, 1917.....	Agnes Nestor.....	do.	do.	do.	99.85
Sept. 3 to Sept. 9, 1917.....	do.	do.	do.	do.	70.75
Nov. 22 to Nov. 25, 1917.....	do.	do.	do.	do.	72.75
Jan. 6 to Jan. 15, 1918.....	do.	do.	do.	do.	52.45
Mar. 3, 1918.....	do.	do.	Philadelphia, Pa.	Field work of Woman's Committee.	9.03
Mar. 23 to Mar. 27, 1918.....	do.	do.	Washington, D. C.	Conference of Woman's Committee.	54.90
June 24 to July 4, 1918.....	do.	do.	do.	do.	106.15
Nov. 25 to Nov. 28, 1918.....	Hannah J. Patterson.....	do.	do.	do.	22.25
Jan. 1 to Feb. 3, 1918.....	do.	do.	do.	do.	30.97
Feb. 23 to Mar. 30, 1918.....	do.	do.	do.	do.	21.40
Apr. 4 to June 28, 1918.....	do.	do.	Atlantic City, N. J.	do.	65.95
Mar. 1 to Mar. 3, 1918.....	Jessica B. Peixotto.....	do.	New York, N. Y.	Field work of Woman's Committee.	12.32
Feb. 21 to Feb. 23, 1918.....	do.	do.	Philadelphia, Pa.	do.	13.30
Apr. 5 to Apr. 8, 1918.....	do.	do.	Newark, N. J., and New York, N. Y.	do.	14.05
Apr. 28 to Apr. 29, 1918.....	do.	do.	New York, N. Y., and Hartford, Conn.	do.	27.30
May 7 to May 9, 1918.....	do.	do.	Kansas City, Mo.	do.	30.08
May 14 to May 18, 1918.....	do.	do.	New York, N. Y., Detroit, Mich., and Minneapolis, Minn.	do.	89.55
June 15 to June 19, 1918.....	do.	do.	Greenwich, Conn.	do.	26.05
July 11 to July 12, 1917.....	Anna Howard Shaw.....	do.	New Haven, Conn.	do.	15.74
Nov. 15 to Nov. 16, 1917.....	do.	do.	do.	do.	24.19

Mar. 15 to Apr. 7, 1918.	Anna Howard Shaw	Member of Woman's committee.	Points in the States of Florida, Alabama, Mississippi, Louisiana, Tennessee, Indianapolis, Ind. Columbia, S. C. Washington, D. C.	Field work of Woman's Committee.	153.49
Apr. 15 to Apr. 19, 1918.	do.	do.	do.	do.	51.41
Apr. 22 to Apr. 26, 1918.	do.	do.	do.	do.	30.54
Aug. 1 to Aug. 2, 1917.	do.	do.	do.	Conference of Woman's Committee.	20.19
Aug. 14 to Aug. 17, 1917.	do.	do.	do.	do.	26.72
Sept. 23 to Sept. 26, 1917.	do.	do.	do.	do.	35.22
Nov. 28 to Dec. 6, 1917.	do.	do.	do.	do.	40.97
May 19 to May 24, 1918.	do.	do.	do.	do.	33.82
Jan. 27 to Jan. 31, 1918.	do.	do.	do.	do.	31.22
June 23 to June 28, 1918.	do.	do.	do.	do.	41.42
Mar. 28 to Apr. 17, 1918.	Grace Tabor	do.	Points in the State of New York.	Field work of Woman's Committee.	131.94
July 27 to Aug. 3, 1917.	Ida M. Tarbell	do.	New York, N. Y., Concord, N. H., and Boston, Mass.	do.	24.70
Jan. 24 to Jan. 28, 1918.	do.	do.	Washington, D. C.	do.	26.80
Feb. 21 to Mar. 1, 1918.	do.	do.	do.	Conference of Woman's Committee.	45.40
June 23 to June 29, 1918.	do.	do.	do.	do.	46.27
Aug. 1 to Aug. 3, 1917.	Maude K. Wetmore	do.	do.	do.	31.15
Sept. 23 to Sept. 26, 1917.	do.	do.	do.	do.	32.75
Nov. 24 to Nov. 26, 1917.	do.	do.	do.	do.	17.30
Jan. 27 to Jan. 31, 1918.	do.	do.	do.	do.	21.05
Mar. 24 to Mar. 27, 1918.	do.	do.	do.	do.	17.05
May 11 to May 15, 1918.	do.	do.	do.	do.	13.80
May 19 to May 22, 1918.	do.	do.	do.	do.	19.70
Aug. 4 to Sept. 7, 1917.	Alice H. Wood	do.	Points in the States of Indiana, Illinois, Ohio, Kentucky, Michigan, Iowa, Kansas, and Nebraska.	Field work of Woman's Committee.	287.13
Apr. 16 to Apr. 28, 1918.	D. E. Sawyer	Expert.	Points in the States of Pennsylvania and Ohio.	Investigations for Steel Committee.	107.43
May 5 to May 21, 1918.	do.	do.	Buffalo, N. Y., Ashland, Ky., and points in the State of Ohio.	do.	142.15
June 7 to June 14, 1918.	do.	do.	Points in the States of New York, New Jersey and Pennsylvania.	do.	85.11
June 16 to June 17, 1918.	do.	do.	Pittsburgh, Pa.	do.	35.50
May 20 to May 22, 1918.	Chester D. Tripp.	do.	New York, N. Y.	Investigations for Committee on Chemicals.	29.45
May 2 to May 6, 1918.	Arthur E. Crockett	do.	do.	Investigations for Finished Products Section.	22.93
May 10 to May 12, 1918.	do.	do.	do.	do.	19.75
May 24 to May 26, 1918.	do.	do.	Philadelphia and Chester, Pa.	do.	13.98
Apr. 25 to Apr. 28, 1918.	Hugh W. Sanford	do.	New York, N. Y.	Investigations for Committee on Chemicals.	14.17
May 6 to May 7, 1918.	do.	do.	Pittsburgh, Pa.	do.	19.60
Total expenditure for travel and subsistence.					15, 143.75

